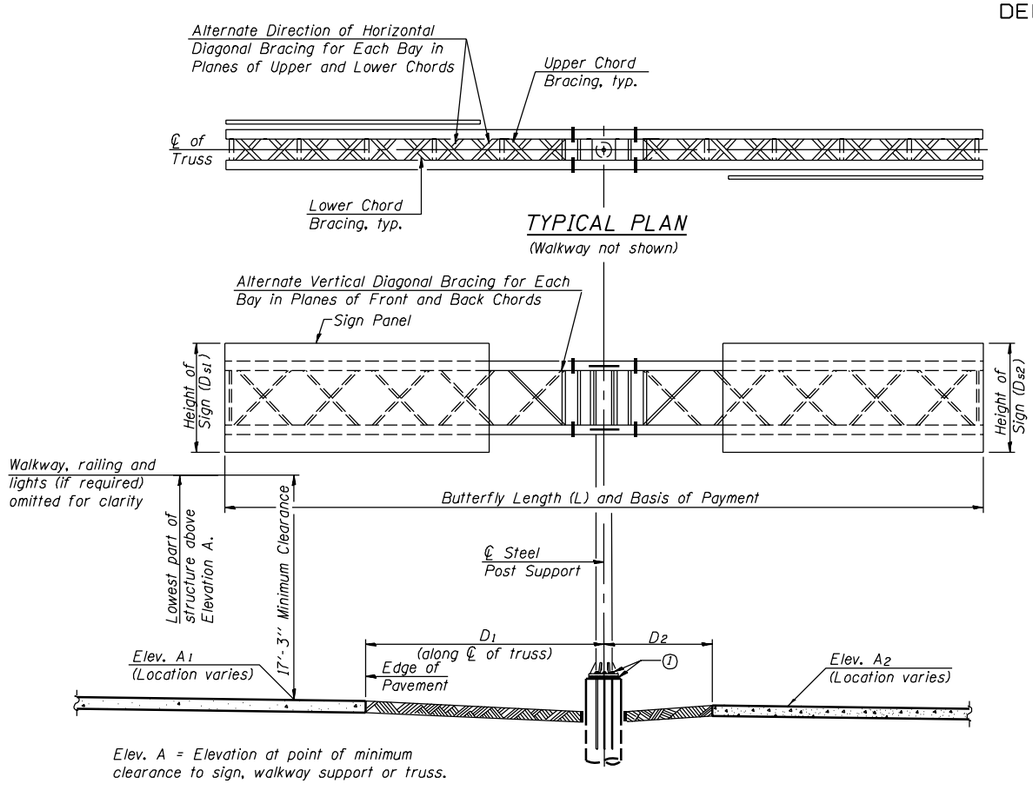
CELL / MODEL NAME	DESCRIPTION	DATE
OSF-A-1	General plan and elevation, aluminum truss and steel post	7/1/2006
OSF-A-1-DMS	Alternate general plan and elevation for DMS	7/1/2006
OSF-A-2	Truss details, aluminum truss and steel post	7/1/2006
OSF-A-2-DMS	Alternate truss details for DMS	7/1/2006
OSF-A-2A	Truss details, aluminum truss and steel post	7/1/2006
OSF-A-D	Damping device	7/1/2006
OSF-A-3	Juncture details, aluminum truss and steel post	7/1/2006
OSF-A-4	Type I-F-A truss support, aluminum truss and steel post	7/1/2006
OSF-A-5	Type II-F-A and III-F-A truss support	7/1/2006
OSF-A-5-DMS	Alternate type III-F-A truss support for DMS	7/1/2006
OSF-A-6	Aluminum walkway details, aluminum truss and steel post	7/1/2006
OSF-A-6-DMS	Alternate aluminum walkway details for DMS	7/1/2006
OSF-A-6S	Alternate steel walkway details	7/1/2006
OSF-A-7	Walkway details, aluminum truss and steel post	7/1/2006
OSF-A-7-DMS	Alternate walkway details for DMS	7/1/2006
OSF-A-7S	Alternate steel walkway details	7/1/2006
OSF-A-8	Handrail details, aluminum truss and steel post	7/1/2006
OSF-A-9	Drilled shaft foundation detail	7/1/2006
OSF-A-1-VMS	Plan and elevation for front access VMS	7/1/2006
OSF-A-2-VMS	Truss details for front access VMS	7/1/2006
OSF-A-2A-VMS	Truss details for front access VMS	7/1/2006
OSF-A-3-VMS	Juncture details for front access VMS	7/1/2006
OSF-A-4-VMS	Type I-F-A support post for front access VMS	7/1/2006
OSF-A-9-VMS	Drilled shaft for front access VMS	7/1/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. - - SHEETS

Contract #



Elev. A = Elevation at point of minimum clearance to sign, walkway support or truss.

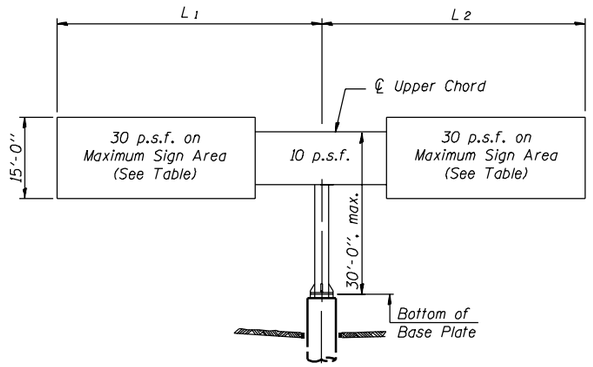
TYPICAL PLAN
(Walkway not shown)

TYPICAL ELEVATION
Looking in Direction of Traffic

Sign support structures may be subject to damaging vibrations and oscillations when sign panels are not in place during erection or maintenance of the structure. To avoid these vibrations and oscillations, consideration should be given to attaching temporary blank sign panels to the structure.

Structure Number	Station	Design Truss Type	Total Butterfly Length (L)	Elev. A_1	Elev. A_2	Dim. D_1	Dim. D_2	D_{s1}	D_{s2}	Total Sign Area 1	Total Sign Area 2

TRUSS TYPE	MAXIMUM SIGN AREA EACH WING	MAXIMUM LENGTH EACH WING
I-F-A	100 Sq. Ft.	25 Ft.
II-F-A	200 Sq. Ft.	30 Ft.
III-F-A	200 Sq. Ft.	35 Ft.



DESIGN WIND LOADING DIAGRAM
Parameters shown are basis for I.D.O.T. Standards Installations not within dimensional limits shown require special analysis for all components.

NUMBER	REVISION	DATE

(1) After adjustments to level truss and insure adequate vertical clearance, all top and bottom leveling nuts shall be tightened against the base plate with a minimum torque of 200 lb.-ft. Stainless steel mesh shall then be placed around the perimeter of the base plate. Secure to base plate with stainless steel banding.

Note:
Trusses shall be shipped individually with adequate provision to prevent detrimental motion during transport. This may require ropes between horizontals and diagonals or energy dissipating (elastic) ties to the vehicle. The contractor is responsible for maintaining the configuration and protection of the trusses.

TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL
OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE I-F-A	Foot	
OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE II-F-A	Foot	
OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE III-F-A	Foot	
OVERHEAD SIGN STRUCTURE WALKWAY, TYPE A	Foot	
DRILLED SHAFT CONCRETE FOUNDATIONS	Cu. Yds.	

GENERAL NOTES

DESIGN: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. ("AASHTO Specifications")

CONSTRUCTION: Current (at time of letting) Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, Supplemental Specifications and Special Provisions. ("Standard Specifications")

LOADING: 90 M.P.H. WIND VELOCITY
WIND LOADING: 30 p.s.f. normal to Sign Panel Area and truss elements not behind sign Loading Diagram.
WALKWAY LOADING: Dead load plus 500 lbs. concentrated live load.

DESIGN STRESSES
FIELD UNITS
f'c = 3,500 p.s.i.
fy = 60,000 p.s.i. (reinforcement)

WELDING: All welds to be continuous unless otherwise shown. All welding to be done in accordance with current AWS D1.1 and D1.2 Structural Welding Codes (Steel and Aluminum) and the Standard Specifications.

MATERIALS: Aluminum Alloys as shown throughout plans. All Structural Steel Pipe shall be ASTM A53 Grade B with a minimum yield of 35,000 p.s.i., or A500 Grade B or C with a minimum yield of 46,000 p.s.i. If A500 pipe is substituted for A53, then the outside diameter shall be as detailed and wall thickness greater than or equal to A53.
All Structural Steel Plates and Shapes shall conform to AASHTO M270 Gr. 36, Gr. 50 or Gr. 50W* (M183, M223 Gr. 50, or M222). Stainless steel for shims, sleeves and handhole covers shall be ASTM A240, Type 302 or 304, or another alloy suitable for exterior exposure and acceptable to the Engineer.
The steel pipe and stiffening ribs at the base plate for the column shall have a minimum longitudinal Charpy V-Notch (CVN) energy of 15 lb.-ft. at 40° F. (Zone 2) before galvanizing.

FASTENERS FOR ALUMINUM TRUSSES: All bolts noted as "high strength" must satisfy the requirements of AASHTO M164 (ASTM A325), or approved alternate, and must have matching lock nuts. Threaded studs for splices (if Members interfere) must satisfy the requirements of ASTM A449, ASTM A193, Grade B7, or approved alternate, and must have matching lock nuts. Bolts and lock nuts not required to be high strength must satisfy the requirements of ASTM A307. All bolts and lock nuts must be hot dip galvanized per AASHTO M232. The lock nuts must have nylon or steel inserts. A stainless steel flat washer conforming to ASTM A240 Type 302 or 304, is required under both head and nut or under both nuts where threaded studs are used. High strength bolt installation shall conform to Article 505.04 (f) (2)d of the IDOT Standard Specifications for Road and Bridge Construction. Rotational capacity ("ROCAP") testing of bolts will not be required.

U-BOLTS AND EYEBOLTS: U-Bolts and Eyebolts must be produced from ASTM A276 Type 304, 304L, 316 or 316L, Condition A, cold finished stainless steel, or an equivalent material acceptable to the Engineer. All nuts for U-Bolts and Eyebolts must be lock nuts equivalent to ASTM A307 with nylon or steel inserts and hot dip galvanized per AASHTO M232. A stainless steel flat washer conforming to ASTM A240, Type 302 or 304, is required under each U-Bolt and Eyebolt lock nut.

GALVANIZING: All Steel Grating, Plates, Shapes and Pipe shall be Hot Dip Galvanized after fabrication in accordance with AASHTO M111. Painting is not permitted.

ANCHOR RODS: Shall conform to AASHTO M314 Gr. 55 with a minimum Charpy V-Notch (CVN) energy of 15 lb.-ft. at 10° F.

CONCRETE SURFACES: All concrete surfaces above an elevation 6" below the lowest final ground line at each foundation shall be cleaned and coated with Bridge Seat Sealer in accordance with the Standard Specifications.

REINFORCEMENT BARS: Reinforcement Bars designated (E) shall be epoxy coated in accordance with the Standard Specifications.

* If M270 Gr. 50W (M222) steel is proposed, chemistry for plate to be used shall first be approved by the Engineer as suitable for galvanizing and welding.

BUTTERFLY SIGN STRUCTURES
GENERAL PLAN & ELEVATION
ALUMINUM TRUSS & STEEL POST

DESIGNED -	- 200
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGE DESIGN
	ENGINEER OF BRIDGES AND STRUCTURES

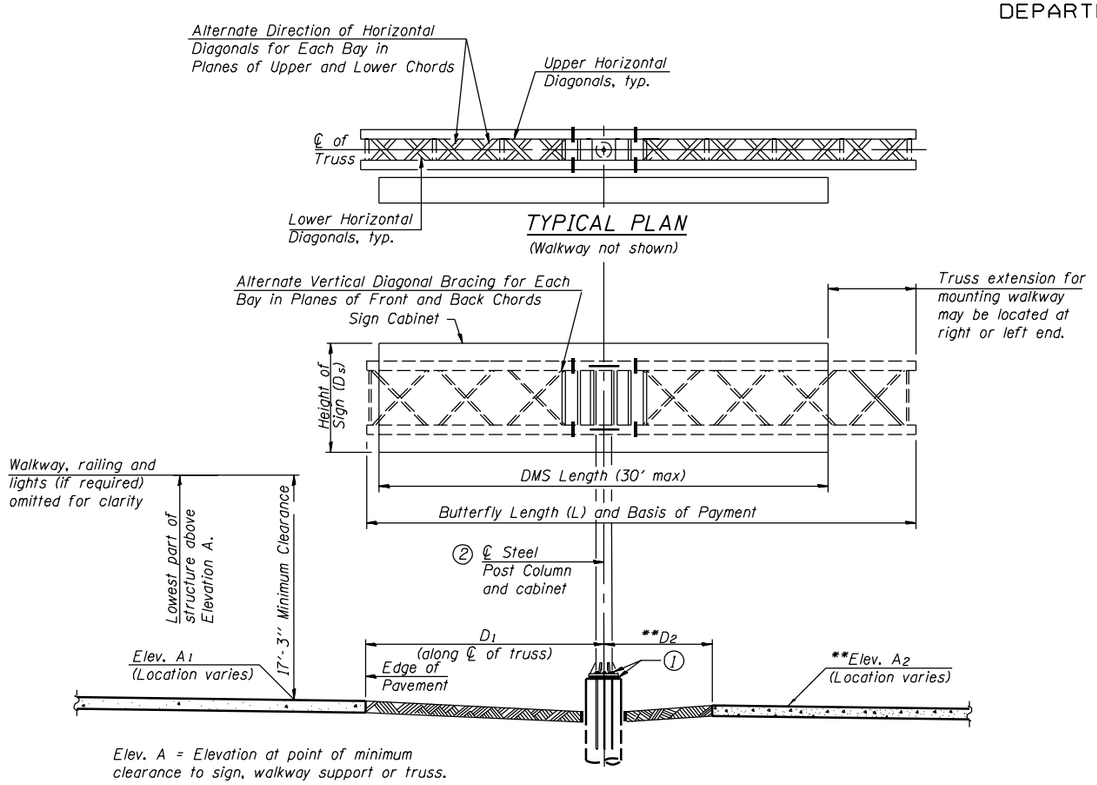
OSF-A-1 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

Contract #



TYPICAL ELEVATION

Looking in Direction of Traffic

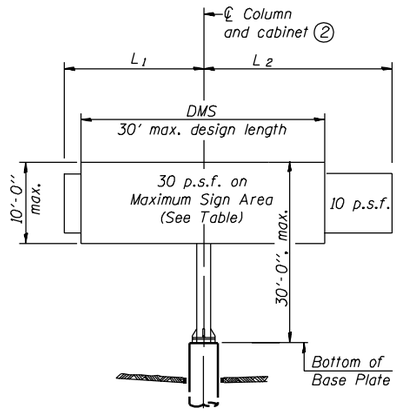
** Elevation A2 and dimension D2 not used when butterfly structure is mounted on right side of the shoulder.

Sign support structures may be subject to damaging vibrations and oscillations when signs are not in place during erection or maintenance of the structure. To avoid these vibrations and oscillations, consideration should be given to attaching temporary blank sign panels to the structure.

Structure Number	Station	Total Butterfly Length (L)	Elev. A_1	Elev. A_2	Dim. D_1	Dim. D_2	D_s	Total Sign Area	Access door and walkway location (Right or Left end)

TRUSS TYPE	MAXIMUM TOTAL DMS SIGN CABINET AREA
III-F-A	300 Sq. Ft.

Mamimum DMS weight = 5000 LB.



DESIGN WIND LOADING DIAGRAM

Parameters shown are basis for I.D.O.T. Standards Installations not within dimensional limits shown require special analysis for all components.

NUMBER	REVISION	DATE

① After adjustments to level truss and insure adequate vertical clearance, all top and bottom leveling nuts shall be tightened against the base plate with a minimum torque of 200 lb.-ft. Stainless steel mesh shall then be placed around the perimeter of the base plate. Secure to base plate with stainless steel banding.

② Centerline cabinet must be located at centerline of column.

Note:
Trusses shall be shipped individually with adequate provision to prevent detrimental motion during transport. This may require ropes between horizontals and diagonals or energy dissipating (elastic) ties to the vehicle. The contractor is responsible for maintaining the configuration and protection of the trusses.

TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL
OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE III-F-A	Foot	
OVERHEAD SIGN STRUCTURE WALKWAY, TYPE A	Foot	
DRILLED SHAFT CONCRETE FOUNDATIONS	Cu. Yds.	

GENERAL NOTES

DESIGN: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. ("AASHTO Specifications")

CONSTRUCTION: Current (at time of letting) Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, Supplemental Specifications and Special Provisions. ("Standard Specifications")

LOADING: 90 M.P.H. WIND VELOCITY
WIND LOADING: 30 p.s.f. normal to DMS Cabinet Area and truss elements not behind sign Loading Diagram.
WALKWAY LOADING: Dead load plus 500 lbs. concentrated live load.

DESIGN STRESSES
FIELD UNITS
f'c = 3,500 p.s.i.
fy = 60,000 p.s.i. (reinforcement)

WELDING: All welds to be continuous unless otherwise shown. All welding to be done in accordance with current AWS D1.1 and D1.2 Structural Welding Codes (Steel and Aluminum) and the Standard Specifications.

MATERIALS: Aluminum Alloys as shown throughout plans. All Structural Steel Pipe shall be ASTM A53 Grade B with a minimum yield of 35,000 p.s.i., or A500 Grade B or C with a minimum yield of 46,000 p.s.i. If A500 pipe is substituted for A53, then the outside diameter shall be as detailed and wall thickness greater than or equal to A53.
All Structural Steel Plates and Shapes shall conform to AASHTO M270 Gr. 36, Gr. 50 or Gr. 50W* (M183, M223 Gr. 50, or M222). Stainless steel for shims, sleeves and handhole covers shall be ASTM A240, Type 302 or 304, or another alloy suitable for exterior exposure and acceptable to the Engineer.
The steel pipe and stiffening ribs at the base plate for the column shall have a minimum longitudinal Charpy V-Notch (CVN) energy of 15 lb.-ft. at 40° F. (Zone 2) before galvanizing.

FASTENERS FOR ALUMINUM TRUSSES: All bolts noted as "high strength" must satisfy the requirements of AASHTO M164 (ASTM A325), or approved alternate, and must have matching lock nuts. Threaded studs for splices (if Members interfere) must satisfy the requirements of ASTM A449, ASTM A193, Grade B7, or approved alternate, and must have matching lock nuts. Bolts and lock nuts not required to be high strength must satisfy the requirements of ASTM A307. All bolts and lock nuts must be hot dip galvanized per AASHTO M232. The lock nuts must have nylon or steel inserts. A stainless steel flat washer conforming to ASTM A240 Type 302 or 304, is required under both head and nut or under both nuts where threaded studs are used. High strength bolt installation shall conform to Article 505.04 (f) (2)d of the IDOT Standard Specifications for Road and Bridge Construction. Rotational capacity ("ROCAP") testing of bolts will not be required.

U-BOLTS AND EYEBOLTS: U-Bolts and Eyebolts must be produced from ASTM A276 Type 304, 304L, 316 or 316L, Condition A, cold finished stainless steel, or an equivalent material acceptable to the Engineer. All nuts for U-Bolts and Eyebolts must be lock nuts equivalent to ASTM A307 with nylon or steel inserts and hot dip galvanized per AASHTO M232. A stainless steel flat washer conforming to ASTM A240, Type 302 or 304, is required under each U-Bolt and Eyebolt lock nut.

GALVANIZING: All Steel Grating, Plates, Shapes and Pipe shall be Hot Dip Galvanized after fabrication in accordance with AASHTO M111. Painting is not permitted.

ANCHOR RODS: Shall conform to AASHTO M314 Gr. 55 with a minimum Charpy V-Notch (CVN) energy of 15 lb.-ft. at 10° F.

CONCRETE SURFACES: All concrete surfaces above an elevation 6" below the lowest final ground line at each foundation shall be cleaned and coated with Bridge Seat Sealer in accordance with the Standard Specifications.

REINFORCEMENT BARS: Reinforcement Bars designated (E) shall be epoxy coated in accordance with the Standard Specifications.

* If M270 Gr. 50W (M222) steel is proposed, chemistry for plate to be used shall first be approved by the Engineer as suitable for galvanizing and welding.

BUTTERFLY SIGN STRUCTURES
ALTERNATE PLAN & ELEVATION FOR DMS
ALUMINUM TRUSS & STEEL POST

DESIGNED -	- 200
CHECKED -	EXAMINED
DRAWN -	ENGINEER OF BRIDGE DESIGN
CHECKED -	PASSED
	ENGINEER OF BRIDGES AND STRUCTURES

OSF-A-1-DMS 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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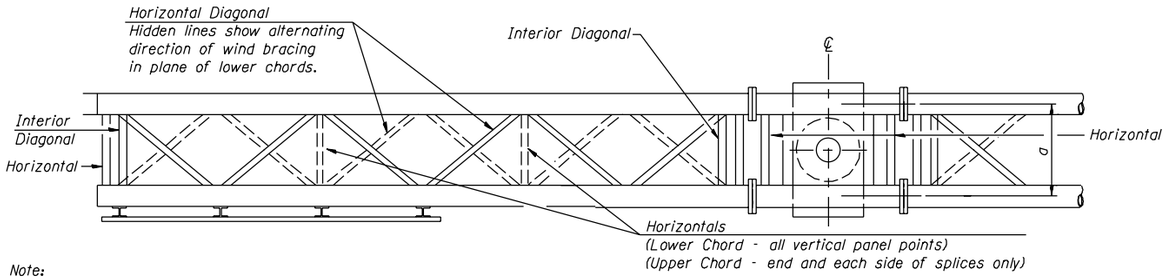
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

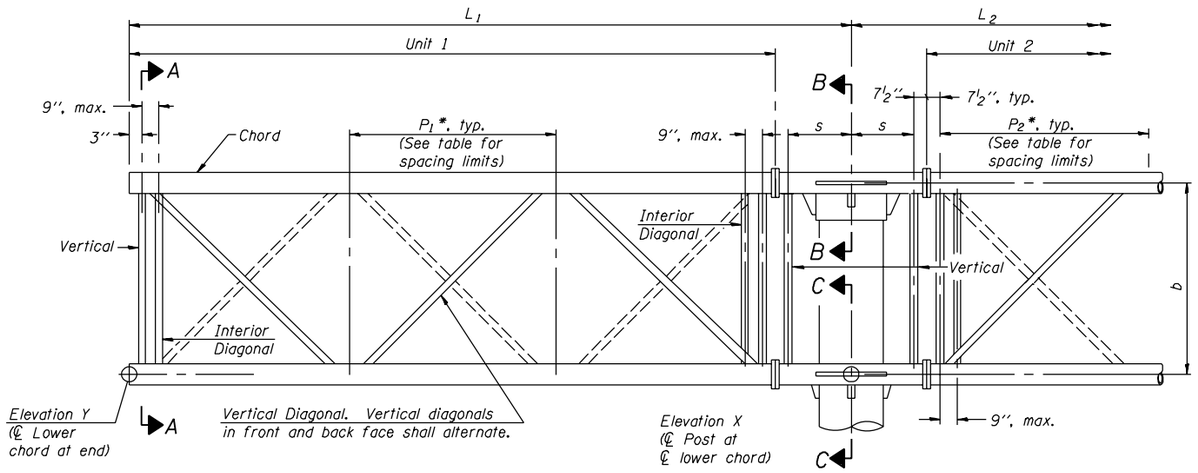
SHEET NO. -
- SHEETS

Contract #



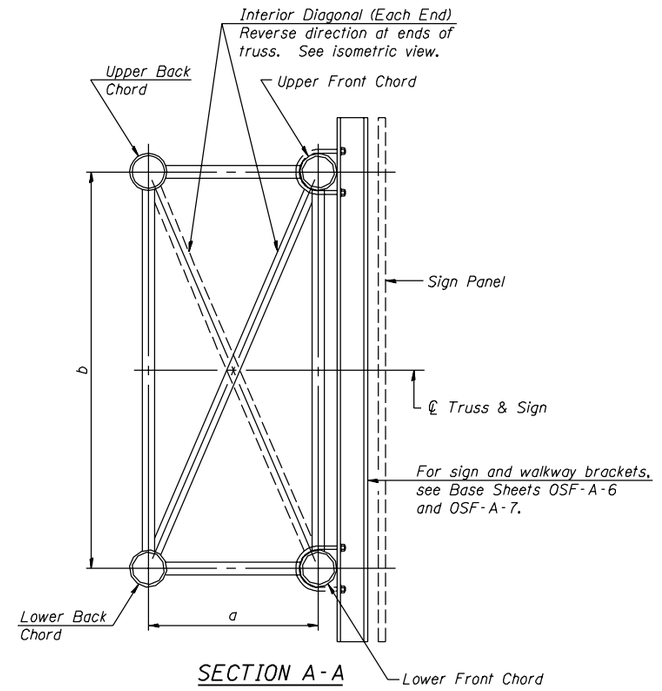
Note:
There are twice as many horizontal diagonals as there are vertical diagonals.

PLAN
(Walkway not shown)



ELEVATION
(Sign and walkway omitted for clarity)

TYPICAL TRUSS UNIT
For Section B-B and Section C-C, see Base Sheet OSF-A-3.



SECTION A-A

TRUSS UNIT TABLE

Truss Type	Dimension "a"	Dimension "b"	Dimension "s"	Limits for Panel Spacing (P)*	Up. & Low. Chord O.D.	Up. & Low. Chord Wall	Verticals; Horizontals; Vertical Horizontals; and Interior Diagonals	
I-F-A	24"	54"	16"	36" min. to 48" max.	5"	5/16"	2½"	5/16"
II-F-A	36"	66"	21"	42" min. to 54" max.	6½"	5/16"	3¼"	5/16"
III-F-A	36"	84"	21"	48" min. to 66" max.	7"	3/8"	3½"	3/8"

*P = (L - s - 1'-6") / # Panels

Structure Number	Station	Truss Type	L_1	L_2	Number of Panels Unit 1	Panel Length (P_1)*	Number of Panels Unit 2	Panel Length (P_2)*

NUMBER	REVISION	DATE

BUTTERFLY SIGN STRUCTURES
TRUSS DETAILS
ALUMINUM TRUSS & STEEL POST

DESIGNED -	
CHECKED -	
DRAWN -	
CHECKED -	

- 200

EXAMINED
ENGINEER OF BRIDGE DESIGN

PASSED
ENGINEER OF BRIDGES AND STRUCTURES

OSF-A-2 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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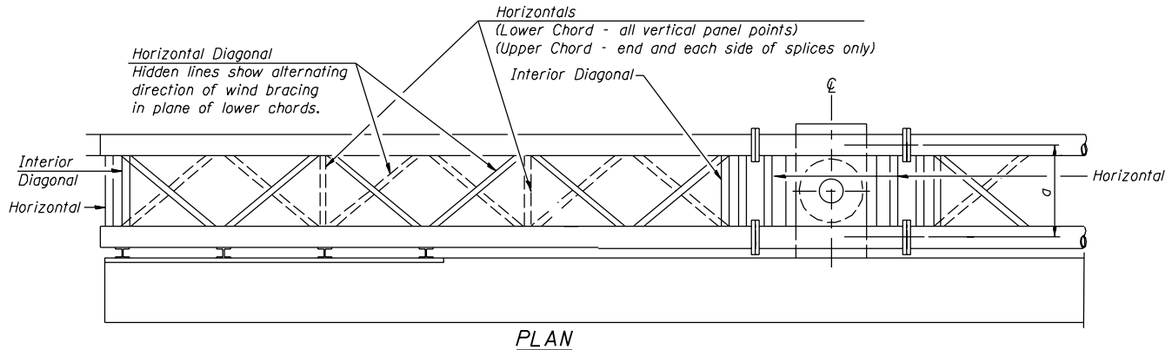
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

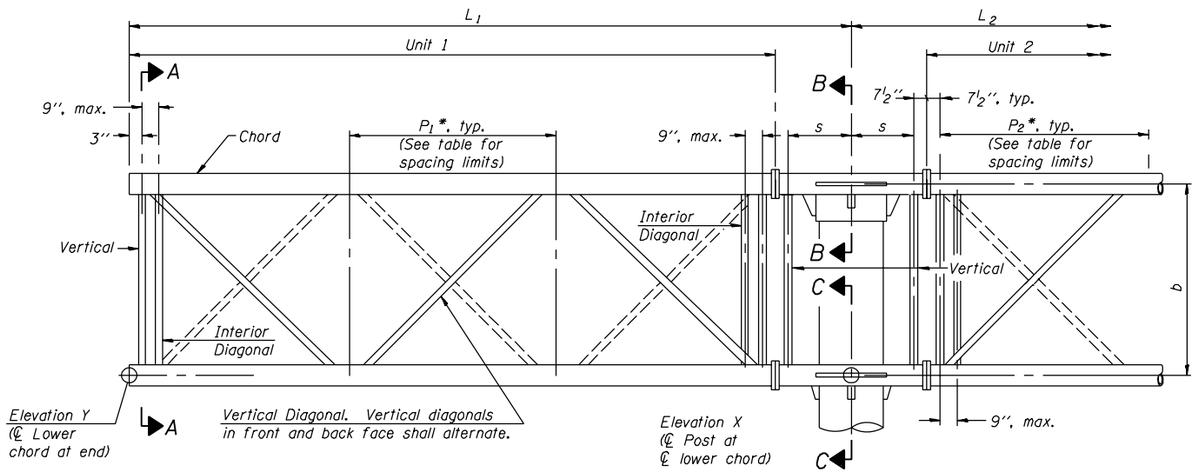
SHEET NO. - - SHEETS

Contract #



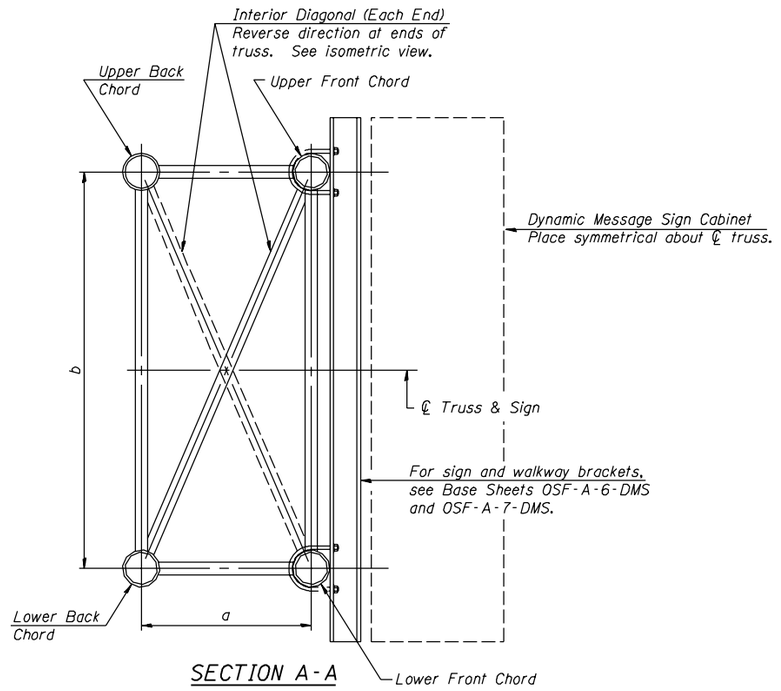
PLAN
(Walkway not shown)

Note:
There are twice as many horizontal diagonals as there are vertical diagonals.



ELEVATION
(Sign and walkway omitted for clarity)

TYPICAL TRUSS UNIT
For Section B-B and Section C-C, see Base Sheet OSF-A-3-DMS



SECTION A-A

Structure Number	Station	Truss Type	L_1	L_2	Number of Panels Unit 1	Panel Length (P_1)*	Number of Panels Unit 2	Panel Length (P_2)*

TRUSS UNIT TABLE

Truss Type	Dimension "a"	Dimension "b"	Dimension "s"	Limits for Panel Spacing (P)*	Up. & Low. Chord O.D.	Up. & Low. Chord Wall	Verticals; Horizontals; Vertical Horizontals; and Interior Diagonals	
III-F-A	36''	84''	21''	48'' min. to 66'' max.	7''	⅜''	3½''	⅜''

*P = (L - s - 1'-6'') / # Panels

NUMBER	REVISION	DATE

BUTTERFLY SIGN STRUCTURES
ALTERNATE TRUSS DETAILS FOR DMS
ALUMINUM TRUSS & STEEL POST

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200

EXAMINED
ENGINEER OF BRIDGE DESIGN

PASSED
ENGINEER OF BRIDGES AND STRUCTURES

OSF-A-2-DMS 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

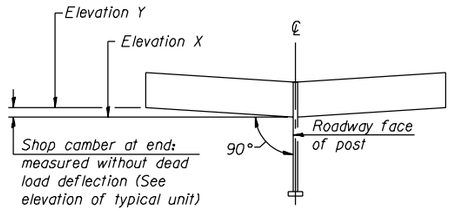
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. -
- SHEETS

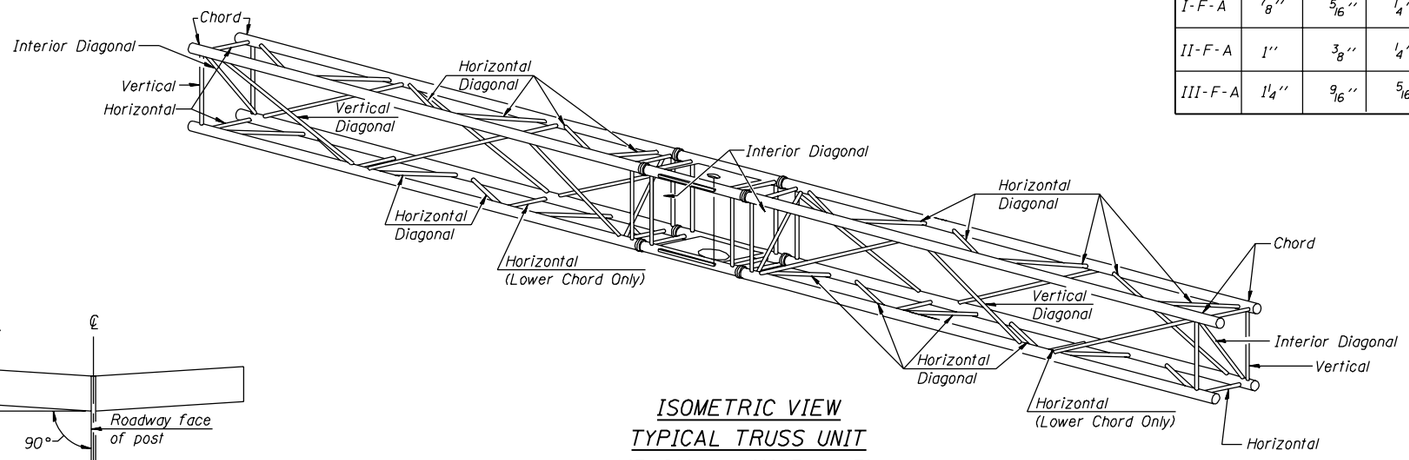
Contract #

SHOP CAMBER TABLE

Unit Length L_1 or L_2	Shop Camber at End
15′	$1\frac{1}{2}$″
16′-17′	$1\frac{3}{4}$″
18′-20′	2″
21′-22′	$2\frac{1}{4}$″
23′-25′	$2\frac{1}{2}$″
26′-27′	$2\frac{3}{4}$″
28′-30′	3″
31′-32′	$3\frac{1}{4}$″
33′-35′	$3\frac{1}{2}$″

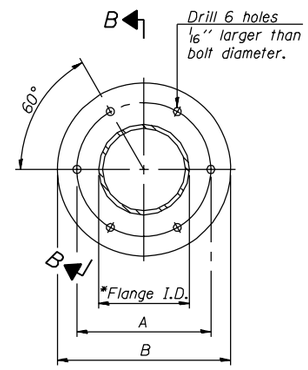


CAMBER DIAGRAM
(For Fabrication Only)



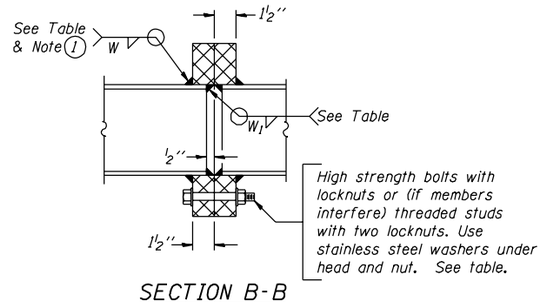
ISOMETRIC VIEW
TYPICAL TRUSS UNIT
ASTM B221 Alloy 6061 Temper T6

Truss Type	Bolts Dia.	Weld Sizes W	Weld Sizes W_1	A	B
I-F-A	$\frac{7}{8}$″	$\frac{5}{16}$″	$\frac{1}{4}$″	$8\frac{3}{4}$″	$11\frac{3}{4}$″
II-F-A	1″	$\frac{3}{8}$″	$\frac{1}{4}$″	11″	$14\frac{1}{2}$″
III-F-A	$1\frac{1}{4}$″	$\frac{9}{16}$″	$\frac{5}{16}$″	$11\frac{1}{2}$″	15″

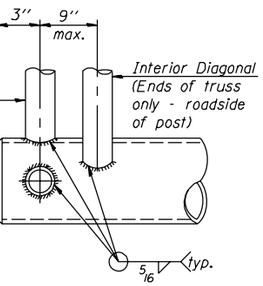


SPLICING FLANGE
ASTM b221, Alloy 6061-T6
or ASTM B209, Alloy 6061-T651

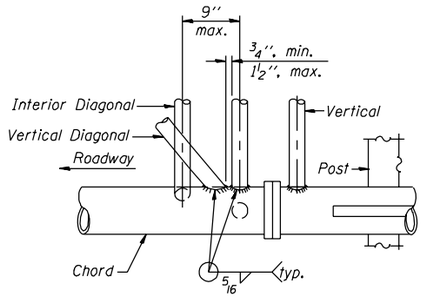
* To fit O.D. of Chord with maximum gap of $\frac{1}{16}$″.



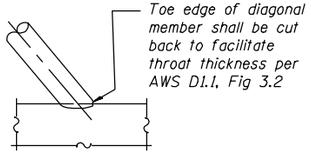
SECTION B-B



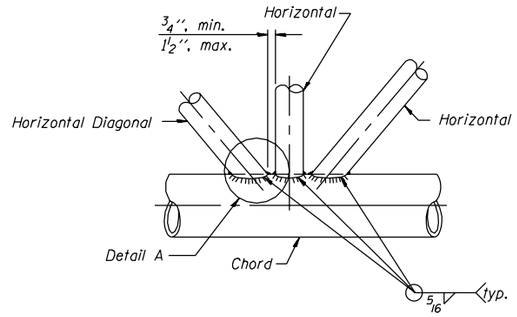
BUTTERFLY END JOINT DETAIL
** Contractor may alternatively use standard aluminum drive-fit cap to close ends.



POST END JOINT DETAIL



DETAIL A



TRUSS INTERIOR JOINT DETAIL

(1) Splicing Flanges shall be attached to each truss unit with the truss shop assembled to camber shown. Truss units shall be in proper alignment and flange surfaces shall be shop bolted into full contact before welding. Sufficient external welds or tacks shall be made to secure flanges until remaining welds are made after disassembly. Adjacent flanges shall be "match marked" to insure proper field assembly.

BUTTERFLY SIGN STRUCTURES
TRUSS DETAILS
ALUMINUM TRUSS & STEEL POST

DESIGNED -	
CHECKED -	
DRAWN -	
CHECKED -	

- 200
EXAMINED
ENGINEER OF BRIDGE DESIGN
PASSED
ENGINEER OF BRIDGES AND STRUCTURES

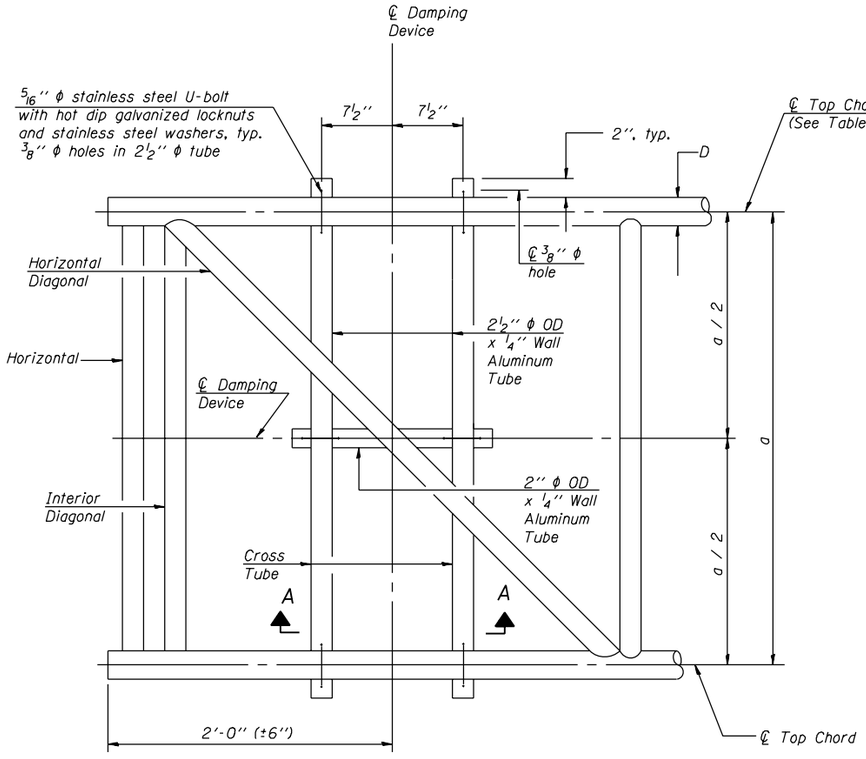
OSF-A-2A 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

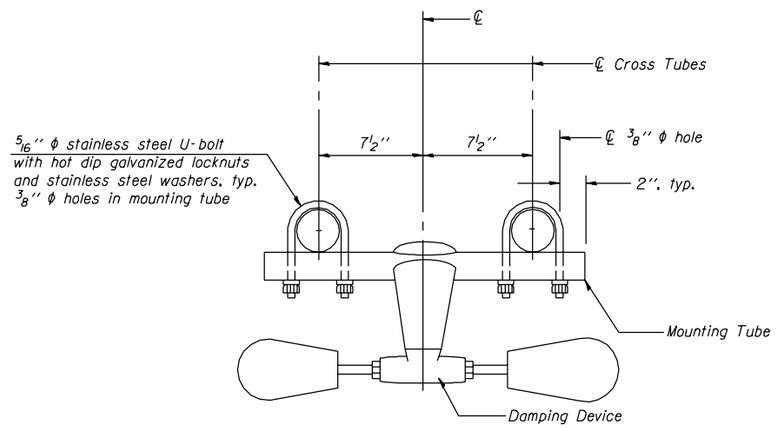
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

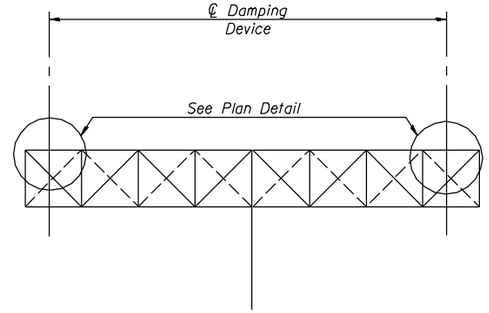
Contract #



PLAN DETAIL



TRUSS DAMPING DEVICE CONNECTION DETAIL

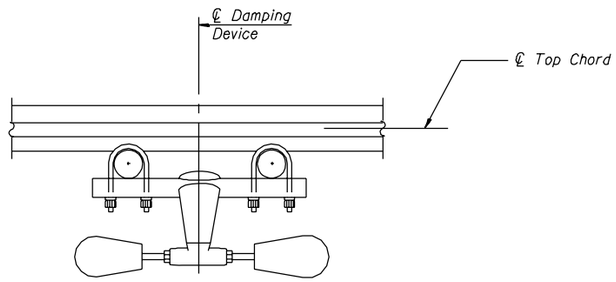


ELEVATION
Aluminum Butterfly Sign Structure

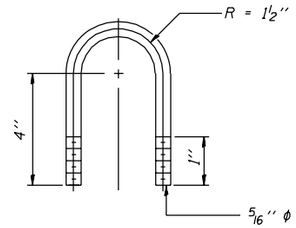
GENERAL NOTES

Damper: One damper per truss. (31 lbs. Stockbridge-Type Aluminum)

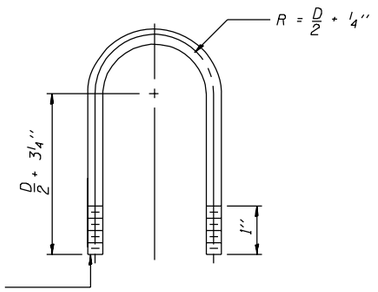
Materials: Aluminum tubes shall be ASTM B221 alloy 6061 temper T6



SECTION A-A



DAMPING DEVICE MOUNTING TUBE U-BOLT DETAIL
(Typical)



TOP CHORD TO CROSS TUBE U-BOLT DETAIL
(Typical)

BUTTERFLY SIGN STRUCTURE
DAMPING DEVICE

DESIGNED -	
CHECKED -	
DRAWN -	
CHECKED -	

- 200
EXAMINED
ENGINEER OF BRIDGE DESIGN
PASSED
ENGINEER OF BRIDGES AND STRUCTURES

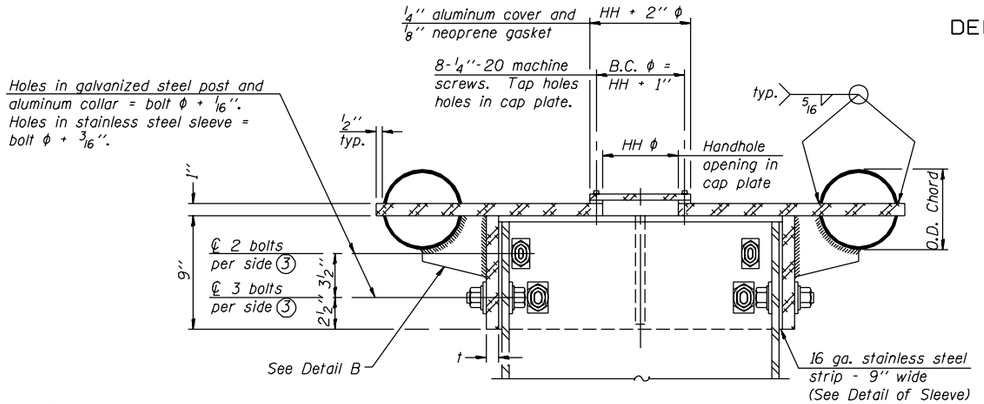
OSF-A-D 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. - - SHEETS

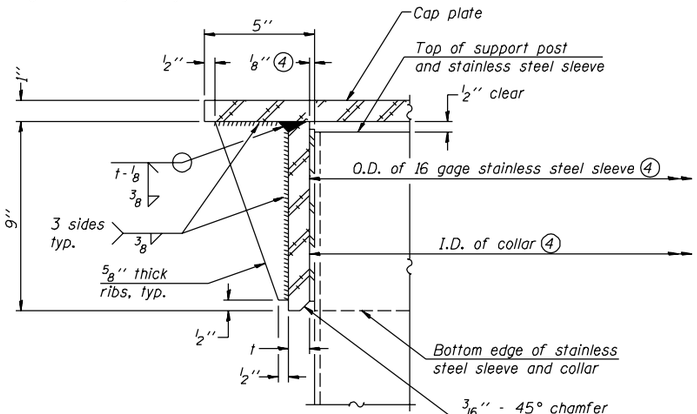
Contract #



SECTION B-B

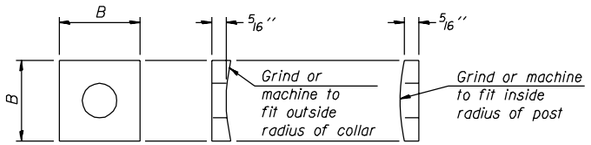
Bolts, washers (including contoured washers), and locknuts shall be stainless steel.

④ Collar I.D. shall be manufactured to correspond to O.D. of actual galvanized post and stainless steel sleeve plus 1/8'' (±1/16''). Maximum gap between post and collar at any location equals 1/8'' before tightening bolts.



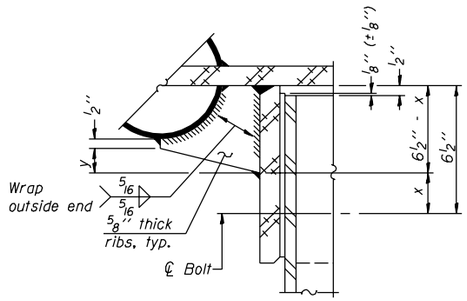
DETAIL A

(Two locations)



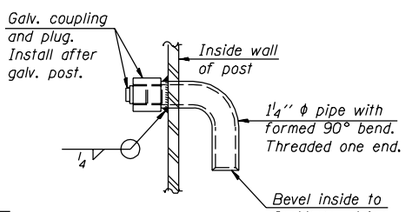
CONTOURED WASHERS

Bolt Size	Contoured Washers	
	Hole Dia.	B
7/8''	1''	2 1/2''
1''	1 1/8''	3''
1 1/4''	1 3/8''	3 1/4''

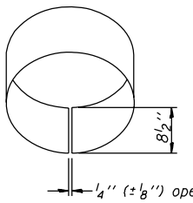


DETAIL B

Two locations
(For details not shown, see Detail C)

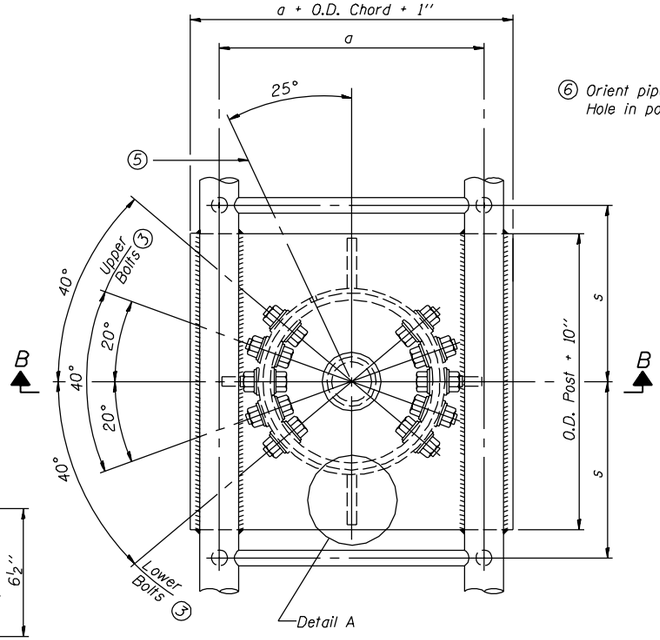


DETAIL D



DETAIL OF STAINLESS STEEL SLEEVE

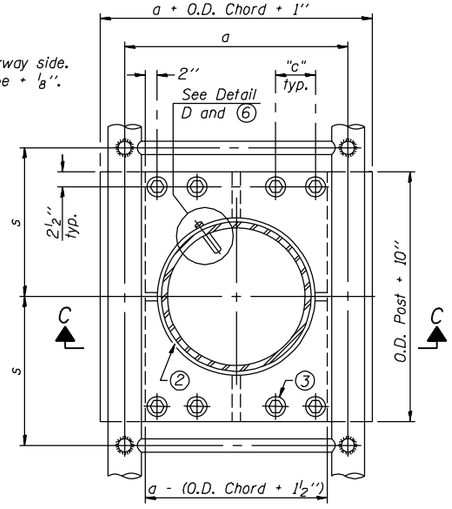
Weld to post after galvanizing.
(Prepare post surface to insure tight, uniform fit and allow welding.)
Welds to be 1 1/2'' long at 6'' cts. along top edge and at 1/4'' opening.



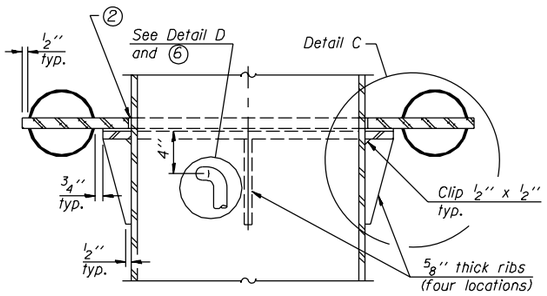
PLAN VIEW - TOP OF COLUMN

⑤ Optional full penetration weld in collar.
(Two locations maximum....(180° apart)....X-ray or UT 100%)

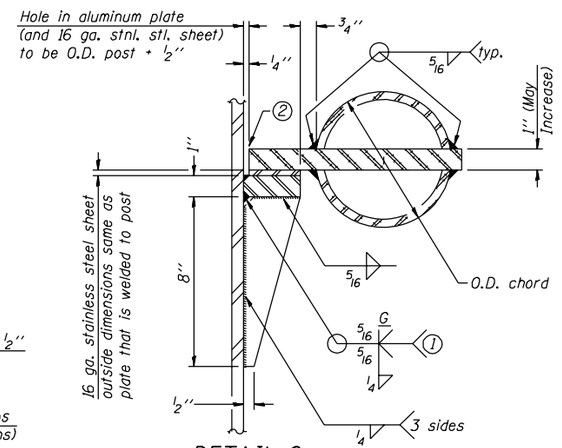
⑥ Orient pipe toward walkway side. Hole in post = O.D. pipe + 1/8''.



SECTION THRU POST ABOVE LOWER CHORDS



SECTION C-C



DETAIL C

① Grind top if required to fully seat aluminum plate and stainless steel sheet.

② After tightening lower connection bolts, fill gap with non-hardening, silicone caulk suitable for exterior exposure and acceptable to the Engineer. Cost is included in Overhead Sign Structure Butterfly.

Truss Type	Post Size	Upper & Lower Connection Bolt Diameter (3)	Lower Juncture Bolt Spacing Dimension "c" (3)	Opening in Cap Plate "HH"	Collar Thickness (t)	Side Ribs	
						x	y
I-F-A	16'' ϕ (83#/')	7/8''	3 1/4''	8''	5/8''	1 3/4''	2 1/4''
II-F-A	24'' ϕ (102#/')	1''	3 1/2''	12''	7/8''	2''	1 1/4''
III-F-A	24'' ϕ (125#/')	1 1/4''	3 1/2''	12''	7/8''	2''	1''

(3) Upper and lower connection bolts in collar and bolts at lower chord connection must be high strength with matching locknuts. Connection bolts shall have two stainless steel flat washers each.

BUTTERFLY SIGN STRUCTURES
JUNCTURE DETAILS
ALUMINUM TRUSS & STEEL POST

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

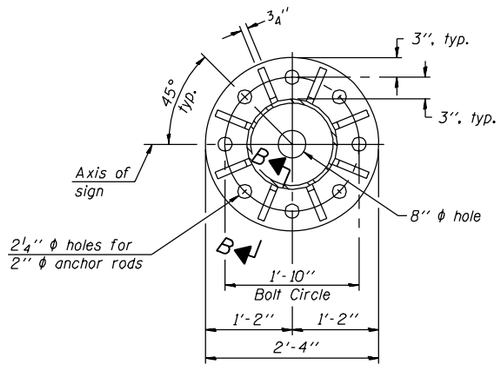
OSF-A-3 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

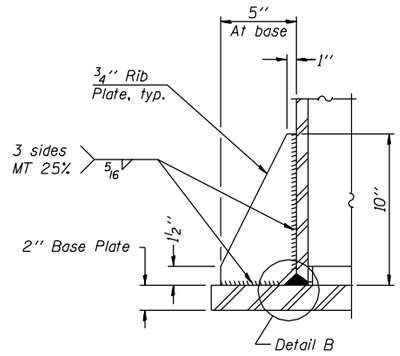
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. - - SHEETS

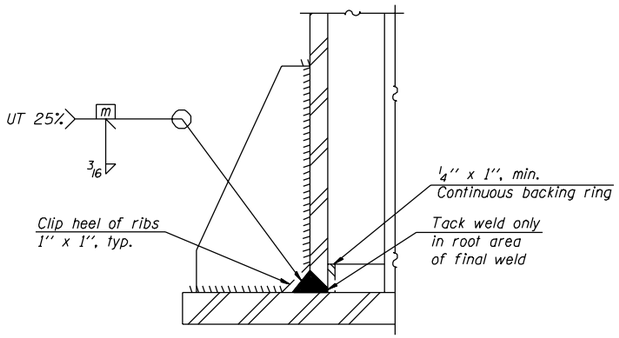
Contract #



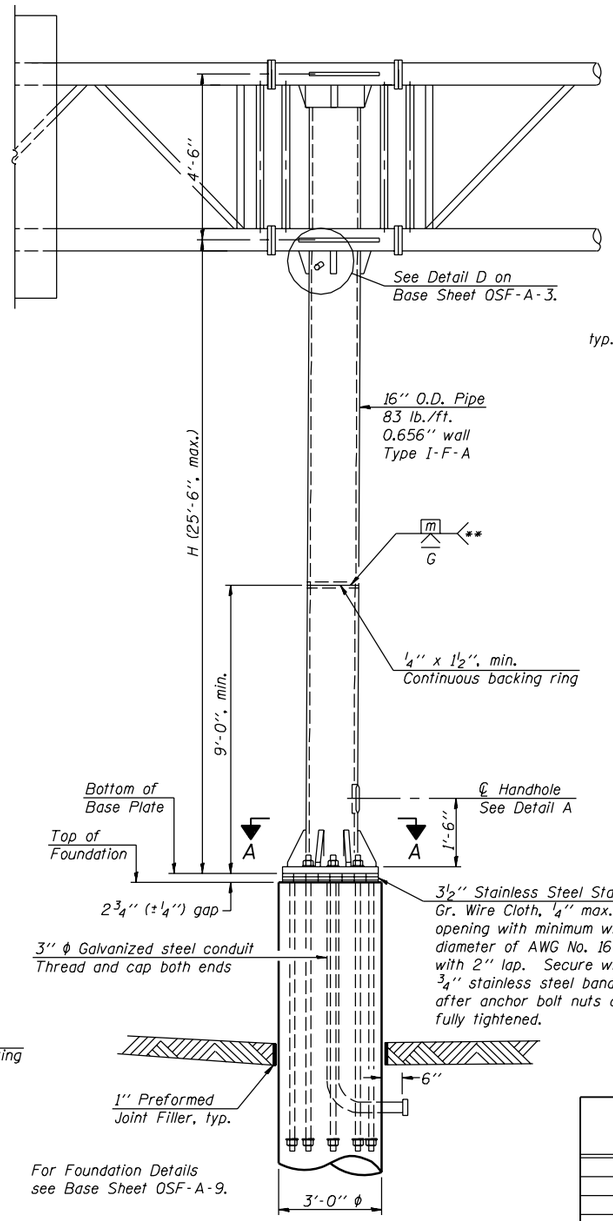
SECTION A-A



SECTION B-B

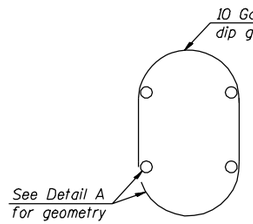


DETAIL B
(Typical rib)

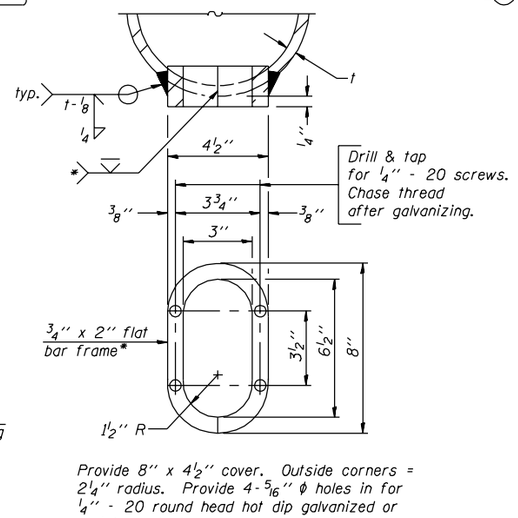


For Foundation Details see Base Sheet OSF-A-9.

FRONT ELEVATION



HANDHOLE COVER

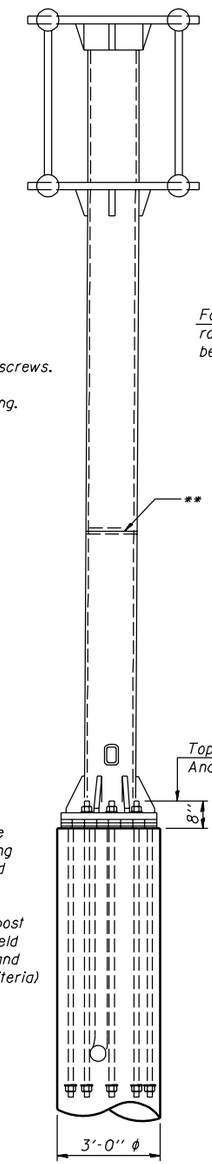


Provide 8'' x 4 1/2'' cover. Outside corners = 2 1/4'' radius. Provide 4-5/16'' ϕ holes in for 1/4'' - 20 round head hot dip galvanized or stainless steel machine screws. (See cover details.)

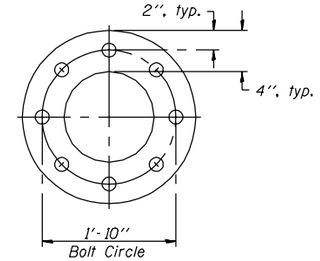
DETAIL A

* Bent bars may be butt welded top and bottom or bottom only. In lieu of fabricated handhole frame as shown, may cut from 2'' plate (rolling direction vertical). All cut faces to be ground to ANSI Roughness of 500 μin or less.

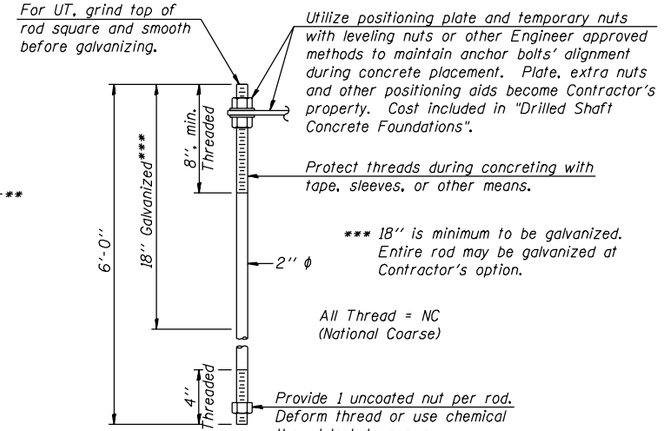
** Butt welded joint in post is only allowed for post heights (H) over 20 ft. in length. If used, weld procedure must be preapproved by Engineer and joint shall receive 100% RT or UT (tension criteria) at Contractor's expense.



SIDE ELEVATION



SUGGESTED POSITIONING PLATE



ANCHOR ROD DETAIL

Anchor rods shall conform to AASHTO M314 Grade 55 and meet Charpy V-Notch (CVN) energy of 15 lb.-ft. at 10° F. before galvanizing. Galvanize the upper 18'' (minimum***) and associated M291, Grade A, C or DH heavy hex nuts and hardened washers per AASHTO M232. No welding shall be permitted on rods. Provide an unfinished nut at bottom, a hexagon locknut and washer above base plate and a leveling nut and washer below base plate. Nuts shall each be tightened with 200 lb.-ft. minimum torque against base plate. Before or after threading, but before galvanizing, each anchor rod shall be ultrasonically tested (UT) by a Level II or III inspector, qualified in accord with ANSI guidelines, using a straight beam, 1/2'' ϕ 3.5 mhz. transducer, to insure no rejectable flaws exist in the upper 18'' (tension criteria). Cost of testing included in Drilled Shaft Concrete Foundations.

Structure Number	Station	H

Note: "H" based on 15'-0'' or actual sign height, whichever is greater.

BUTTERFLY SIGN STRUCTURES
TYPE I-F-A TRUSS SUPPORT POST
ALUMINUM TRUSS & STEEL POST

NUMBER	REVISION	DATE

DESIGNED -
CHECKED -
DRAWN -
CHECKED -

- 200

EXAMINED
ENGINEER OF BRIDGE DESIGN

PASSED
ENGINEER OF BRIDGES AND STRUCTURES

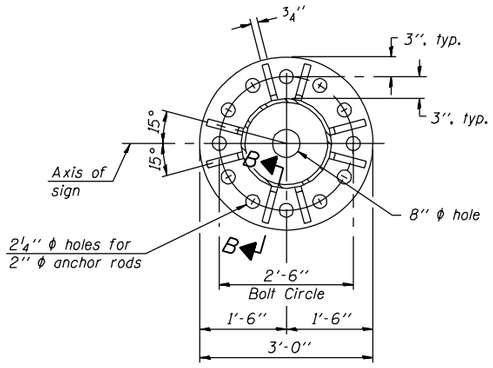
OSF-A-4 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

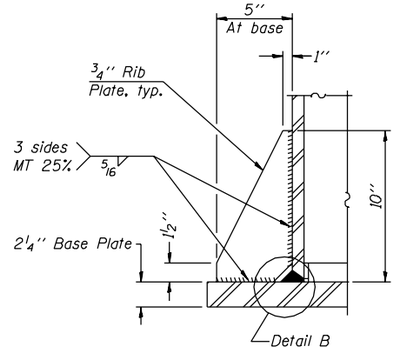
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

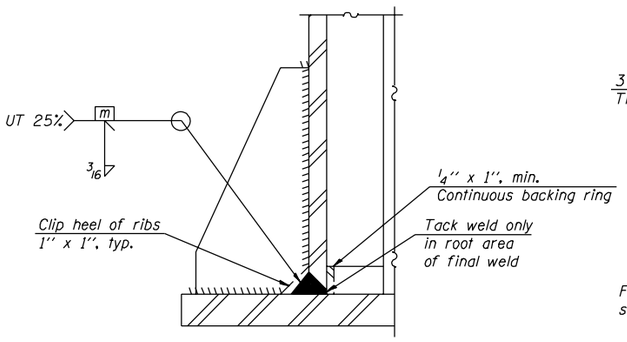
Contract #



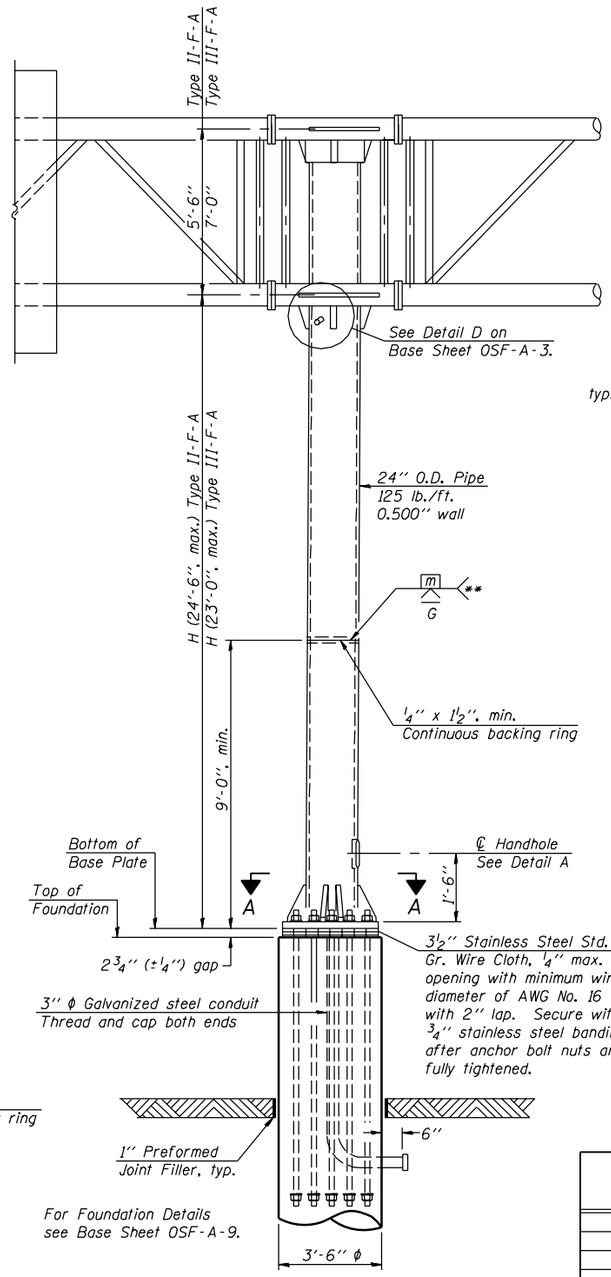
SECTION A-A



SECTION B-B

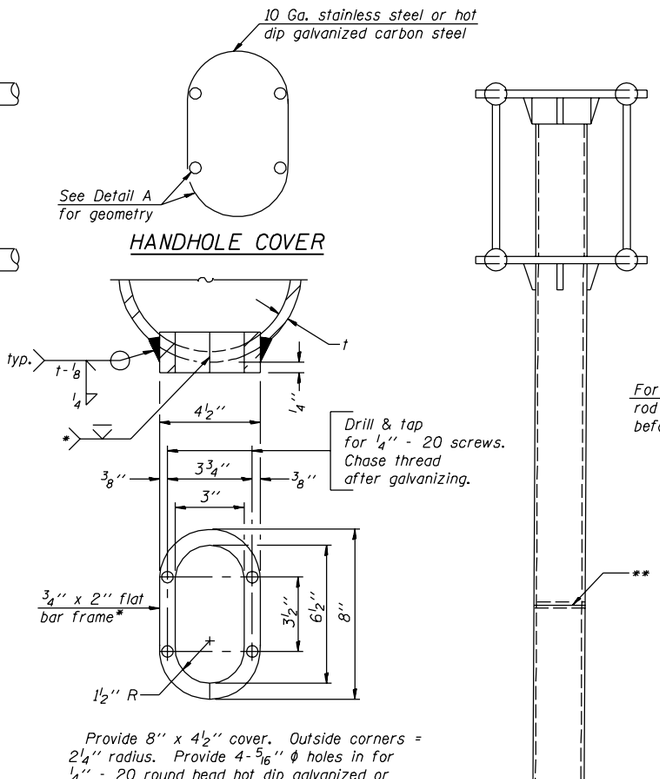


DETAIL B
(Typical rib)



For Foundation Details see Base Sheet OSF-A-9.

FRONT ELEVATION



HANDHOLE COVER

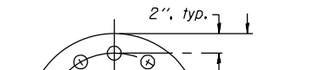
Provide 8" x 4 1/2" cover. Outside corners = 2 1/4" radius. Provide 4-5/16" ϕ holes in for 1/4" - 20 round head hot dip galvanized or stainless steel machine screws. (See cover details.)

DETAIL A

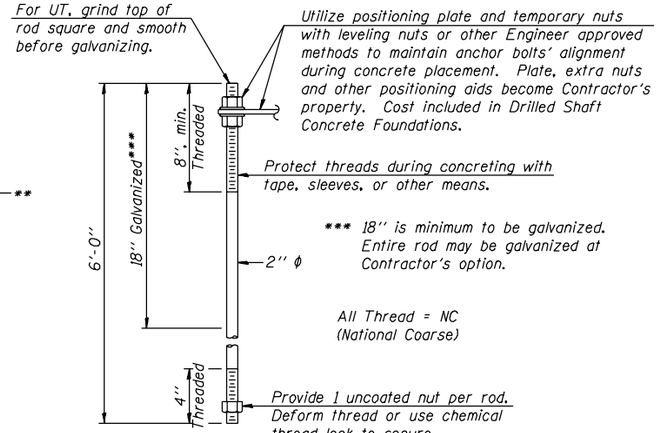
* Bent bars may be butt welded top and bottom or bottom only. In lieu of fabricated handhole frame as shown, may cut from 2" plate (rolling direction vertical). All cut faces to be ground to ANSI Roughness of 500 μin or less.

** Butt welded joint in post is only allowed for post heights (H) over 20 ft. in length. If used, weld procedure must be preapproved by Engineer and joint shall receive 100% RT or UT (tension criteria) at Contractor's expense.

SIDE ELEVATION



SUGGESTED POSITIONING PLATE



ANCHOR ROD DETAIL

Anchor rods shall conform to AASHTO M314 Grade 55 and meet Charpy V-Notch (CVN) energy of 15 lb.-ft. at 10° F. before galvanizing. Galvanize the upper 18" (minimum***) and associated M291, Grade A, C or DH heavy hex nuts and hardened washers per AASHTO M232. No welding shall be permitted on rods. Provide an unfinished nut at bottom, a hexagon locknut and washer above base plate and a leveling nut and washer below base plate. Nuts shall each be tightened with 200 lb.-ft. minimum torque against base plate. Before or after threading, but before galvanizing, each anchor rod shall be ultrasonically tested (UT) by a Level II or III inspector, qualified in accord with ANSI guidelines, using a straight beam, 1/2" ϕ 3.5 mhz. transducer, to insure no rejectable flaws exist in the upper 18" (tension criteria). Cost of testing included in Drilled Shaft Concrete Foundations.

Structure Number	Station	H

Note: "H" based on 15'-0" or actual sign height, whichever is greater.

NUMBER	REVISION	DATE

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

OSF-A-5 7/01/2006

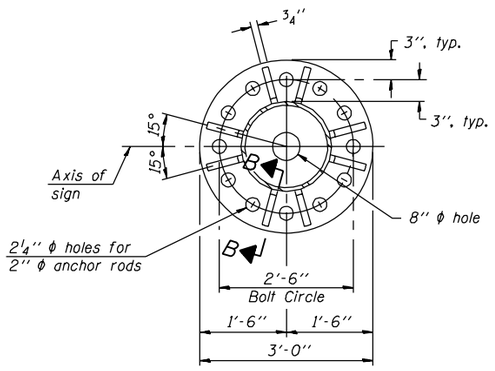
BUTTERFLY SIGN STRUCTURES
TYPE II-F-A & III-F-A TRUSS SUPPORT POST
ALUMINUM TRUSS & STEEL POST

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

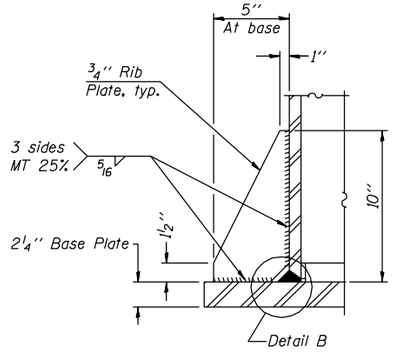
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

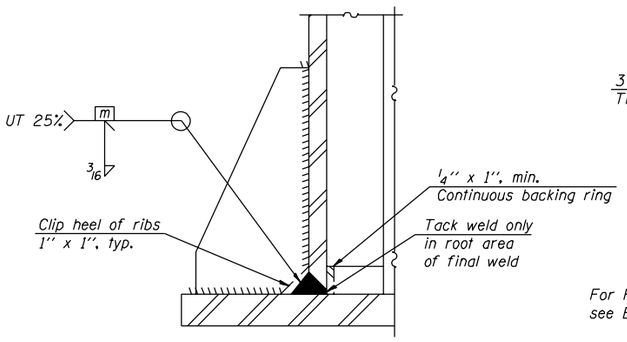
Contract #



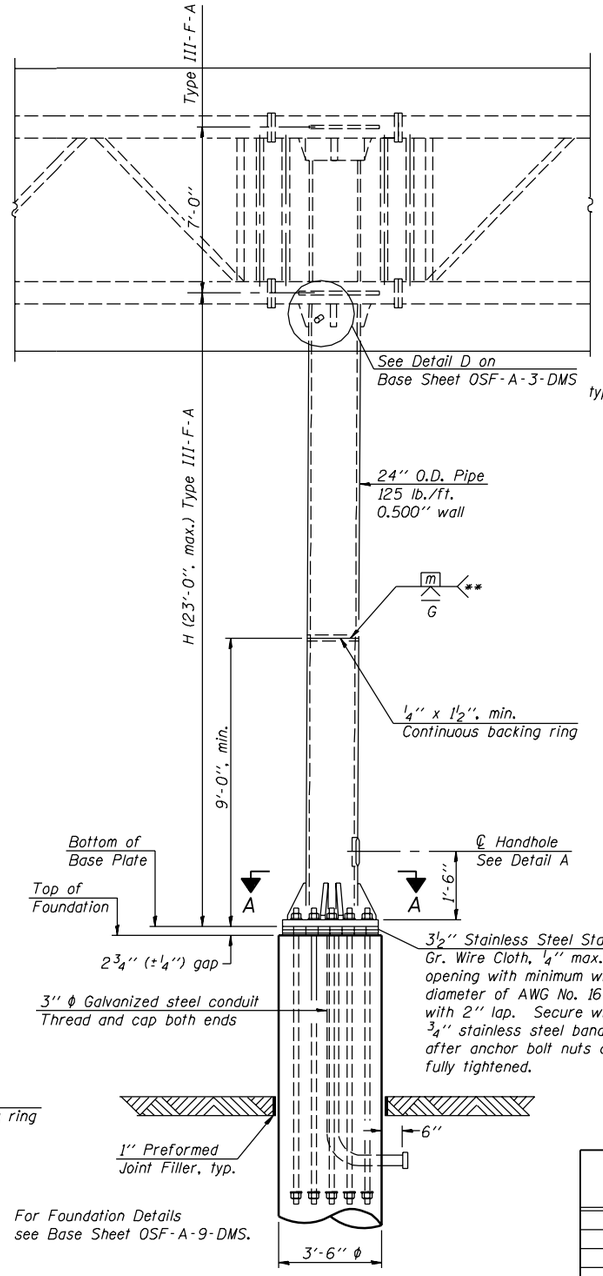
SECTION A-A



SECTION B-B

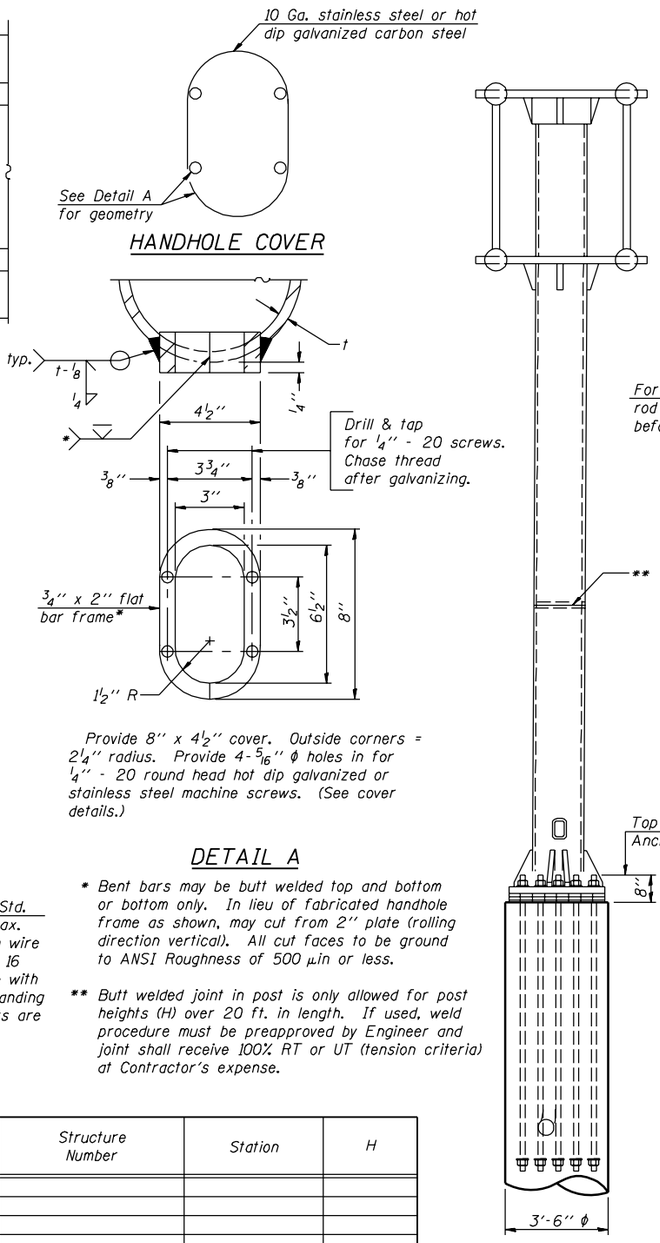


DETAIL B
(Typical rib)



For Foundation Details see Base Sheet OSF-A-9-DMS.

FRONT ELEVATION



HANDHOLE COVER

* Bent bars may be butt welded top and bottom or bottom only. In lieu of fabricated handhole frame as shown, may cut from 2" plate (rolling direction vertical). All cut faces to be ground to ANSI Roughness of 500 μin or less.

** Butt welded joint in post is only allowed for post heights (H) over 20 ft. in length. If used, weld procedure must be preapproved by Engineer and joint shall receive 100% RT or UT (tension criteria) at Contractor's expense.

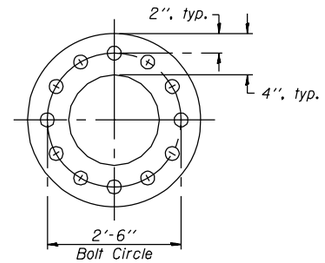
Provide 8" x 4 1/2" cover. Outside corners = 2 1/4" radius. Provide 4-5/16" ϕ holes in for 1/4" - 20 round head hot dip galvanized or stainless steel machine screws. (See cover details.)

DETAIL A

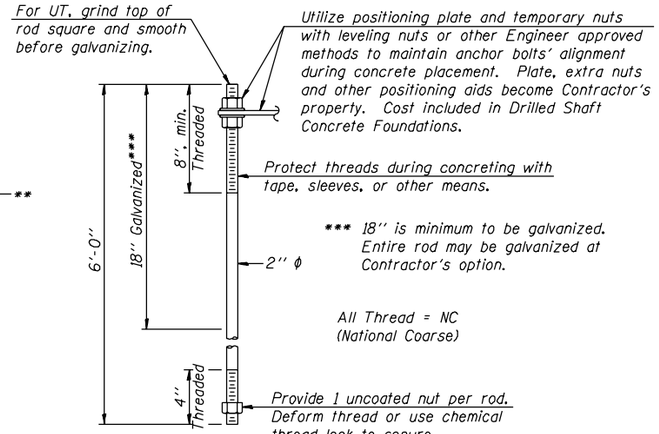
Structure Number	Station	H

Note: "H" based on 15'-0" or actual sign height, whichever is greater.

SIDE ELEVATION



SUGGESTED POSITIONING PLATE



ANCHOR ROD DETAIL

Anchor rods shall conform to AASHTO M314 Grade 55 and meet Charpy V-Notch (CVN) energy of 15 lb.-ft. at 10° F. before galvanizing. Galvanize the upper 18" (minimum***) and associated M291, Grade A, C or DH heavy hex nuts and hardened washers per AASHTO M232. No welding shall be permitted on rods. Provide an unfinished nut at bottom, a hexagon locknut and washer above base plate and a leveling nut and washer below base plate. Nuts shall each be tightened with 200 lb.-ft. minimum torque against base plate. Before or after threading, but before galvanizing, each anchor rod shall be ultrasonically tested (UT) by a Level II or III inspector, qualified in accord with ANSI guidelines, using a straight beam, 1/2" ϕ 3.5 mhz. transducer, to insure no rejectable flaws exist in the upper 18" (tension criteria). Cost of testing included in Drilled Shaft Concrete Foundations.

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

\- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

OSF-A-5-DMS 7/01/2006

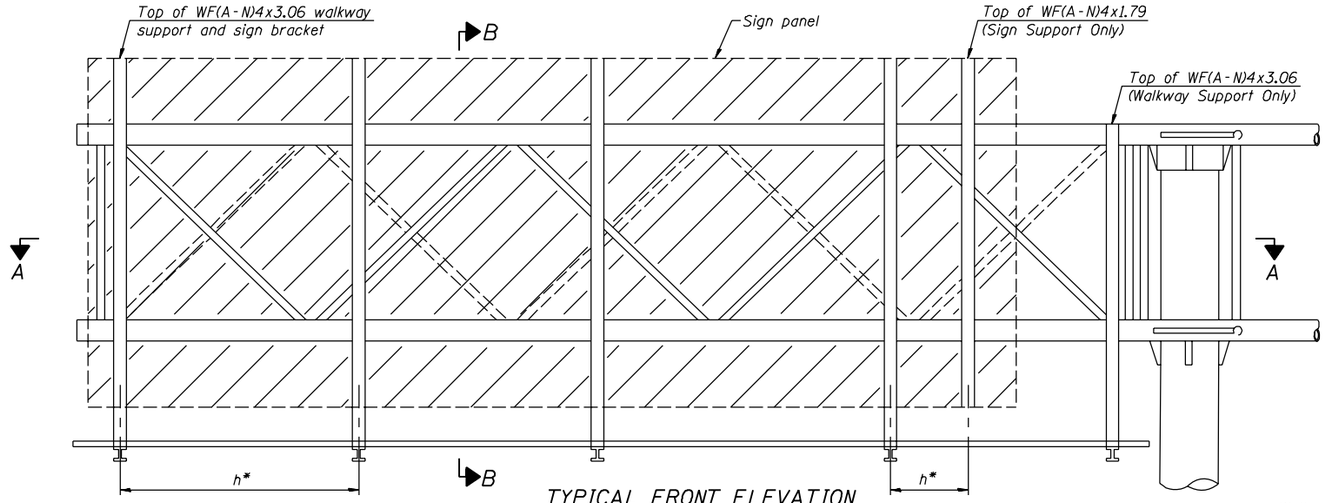
BUTTERFLY SIGN STRUCTURES
TYPE III-F-A TRUSS SUPPORT POST FOR DMS
ALUMINUM TRUSS & STEEL POST

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

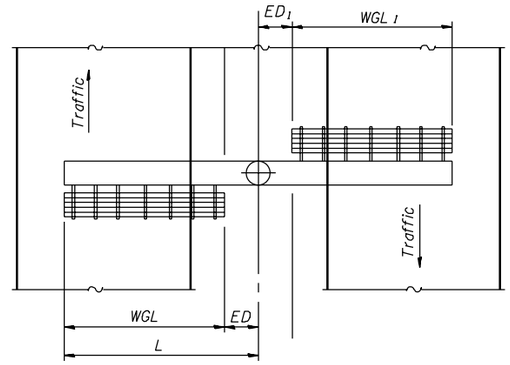
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

Contract #

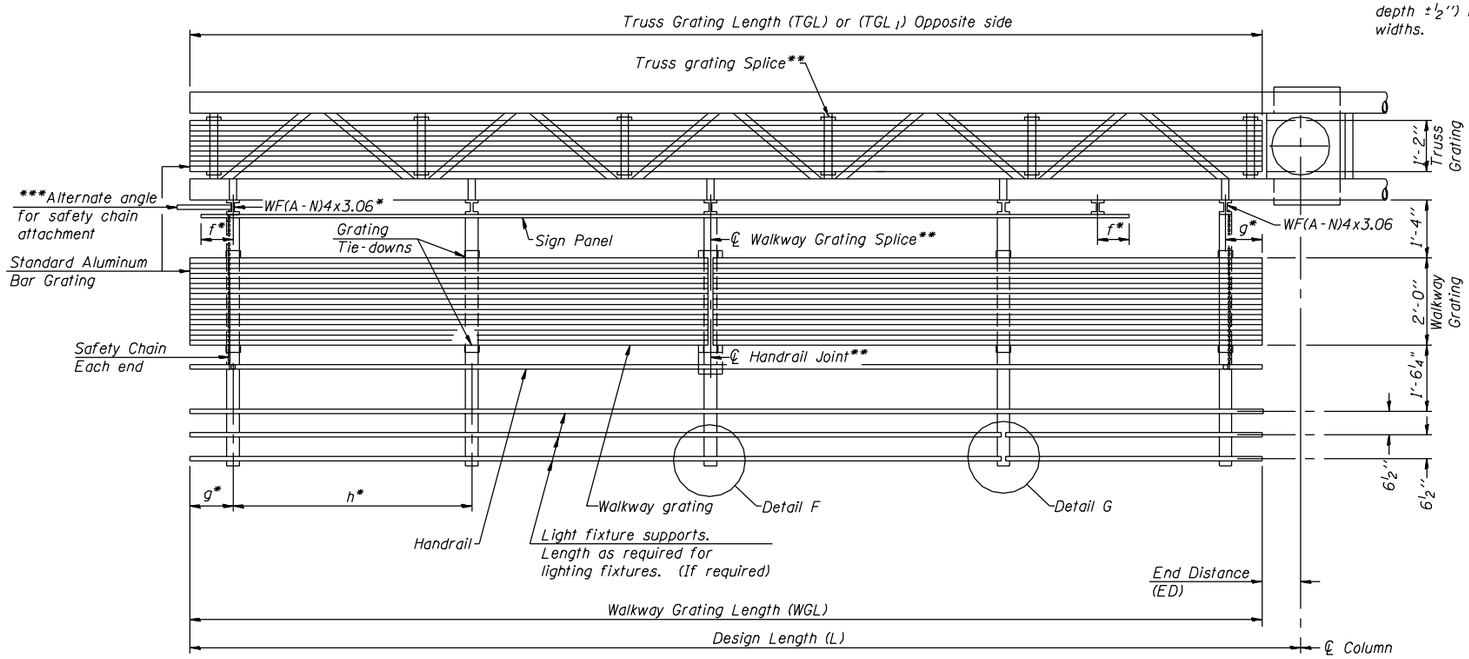


TYPICAL FRONT ELEVATION
With lights and handrail omitted for clarity.



PLAN
WALKWAY AND HANDRAIL SKETCH
(Road plan beneath truss varies)

Walkway and truss grating dimensions are nominal and may vary (width ±½", depth ±½") based on available standard widths.



SECTION A-A

Structure Number	Station	WGL	ED	TGL	WGL 1	ED 1	TGL 1

Notes:
* Space walkway brackets WF(A-N)4x3.06 and sign brackets WF(A-N)4x1.79 for efficiency and within limits shown:

f = 12" maximum, 4" minimum (End of sign to ℄ of nearest bracket)
g = 12" maximum, 4" minimum (End of walkway to ℄ of nearest bracket)
h = 6'-0" maximum (℄ to ℄ sign and/or walkway support brackets, WF(A-N)4x1.79 or WF(A-N)4x3.06)

*** If walkway bracket at safety chain location is behind sign, add angle to bracket. See alternate safety chain attachment on base sheet OSF-A-8.

For details of sign placement, sign/walkway brackets, truss and walkway gratings, grating splices and Section B-B, see Base Sheet OSF-A-7.
For details of handrail, handrail joint, safety chain and Details F and G, see Base Sheet OSF-A-8.

Truss grating to facilitate inspection shall run full length of cantilevers. Cost of truss grating is included in "Overhead Sign Structure Butterfly".

Handrail and walkway grating shall span a minimum of three brackets between splices.
**Use and location of handrail joint or grating splices are optional, based on lengths needed and material availability.

$$TGL = L - \left(\frac{\text{Post O.D.}}{2} + 6''\right)$$

BRACKET TABLE

WF(A-N)4x1.79 or WF(A-N)4x3.06
ASTM B308, Alloy 6061-T6

Sign Width		Number Brackets Required
Greater Than	Less Than or Equal To	
	8'-0"	2
8'-0"	14'-0"	3
14'-0"	20'-0"	4
20'-0"	26'-0"	5
26'-0"	32'-0"	6

NUMBER	REVISION	DATE

BUTTERFLY SIGN STRUCTURES
ALUMINUM WALKWAY DETAILS
ALUMINUM TRUSS & STEEL POST

DESIGNED -	
CHECKED -	
DRAWN -	
CHECKED -	

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

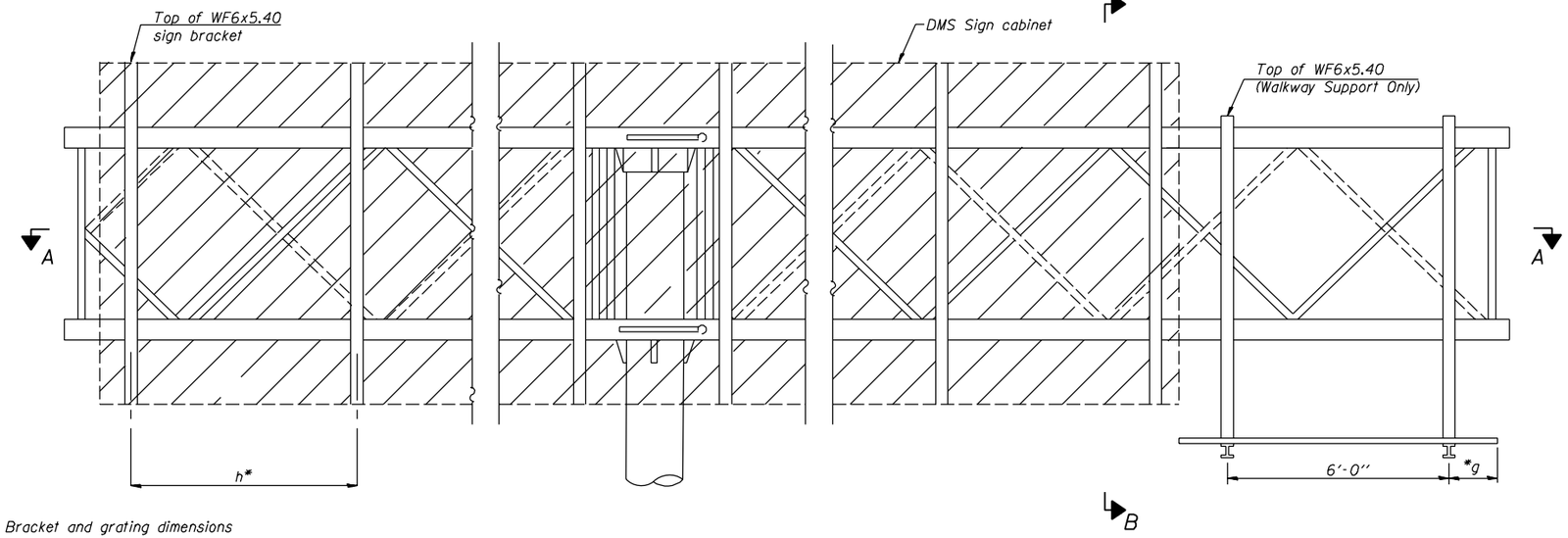
OSF-A-6 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

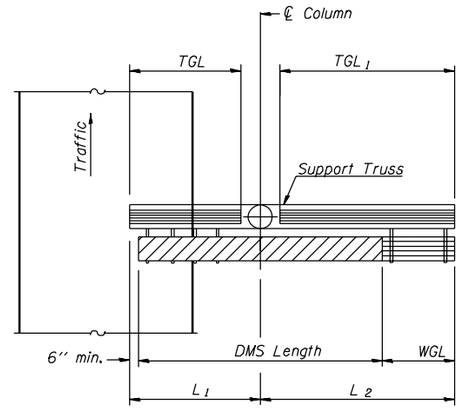
Contract #



Bracket and grating dimensions are nominal and will vary based on actual DMS cabinet dimensions plus manufacturer's mounting devices.

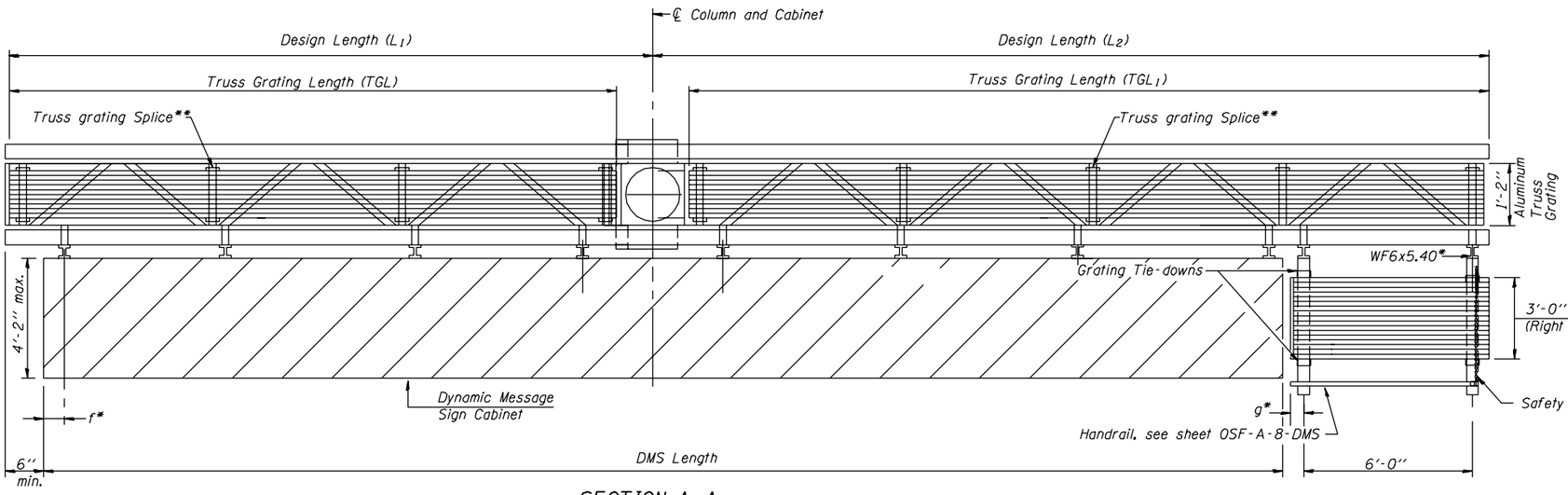
TYPICAL FRONT ELEVATION

With handrail omitted for clarity.
For section B-B see base sheet OSF-A-7-DMS



PLAN
WALKWAY AND HANDRAIL SKETCH

(Road plan beneath truss varies)
Butterfly may be located in shoulder area.
Walkway may be located at right or left end of truss.



SECTION A-A

Handrail and walkway shall span a minimum of three brackets between splices and/or gap joints.
Place all sign and walkway brackets as close to panel points as practical.
** Grating splices and handrail joints placed as needed.
Truss grating to facilitate inspection shall run full length (center to center of support frames) ±12" on overhead trusses. Cost of truss grating is included in Butterfly Sign Structure.

Notes:
Space walkway brackets and sign brackets WF6x5.40 for efficiency and within limits shown:

f = 12" maximum, 4" minimum (End of sign to ℄ of nearest bracket)
g = 12" maximum, 4" minimum (End of walkway grating to ℄ of nearest support bracket)
h = 6'-0" maximum (℄ to ℄ sign and/or walkway support brackets, WF6x5.40

Maximun DMS weight = 5000 lbs.
4'-2" maximun cabinet depth includes depth of cabinet plus connection to WF6x5.40
For Section B-B and Grating Splice Details, see Base Sheet OSF-A-7-DMS.
For Handrail Splice Details, see Base Sheet OSF-A-8-DMS.
Walkway and truss grating width dimensions are nominal and may vary ±½" based on available standard width.

BRACKET TABLE

WF(A-N)4x3.06
ASTM B308, Alloy 6061-T6

Sign Width		Number Brackets Required
Greater Than	Less Than or Equal To	
	8'-0"	2
8'-0"	14'-0"	3
14'-0"	20'-0"	4
20'-0"	26'-0"	5
26'-0"	32'-0"	6

Structure Number	Station	DMS Length	TGL	TGL 1	Walkway Location (Right or Left end of Truss)

$TGL = L_1 \text{ (or } L_2\text{)} - \left(\frac{\text{Post O.D.}}{2} + 6''\right)$

BUTTERFLY SIGN STRUCTURES
ALTERNATE ALUMINUM WALKWAY DETAILS FOR DMS

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200
EXAMINED
ENGINEER OF BRIDGE DESIGN
PASSED
ENGINEER OF BRIDGES AND STRUCTURES

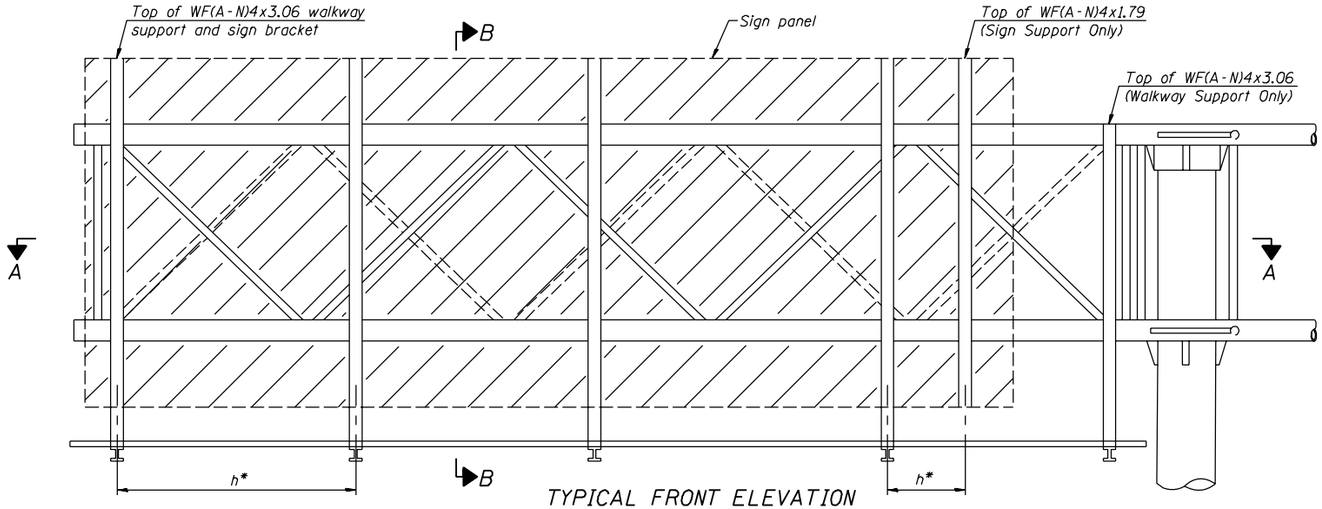
OSF-A-6-DMS 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

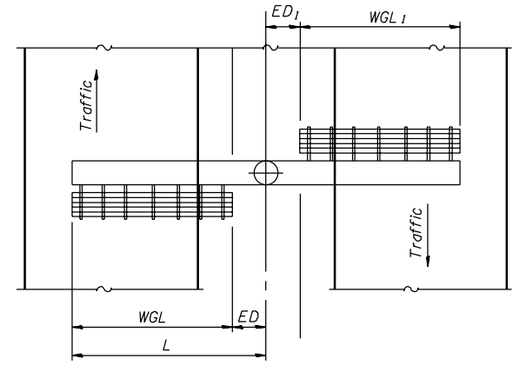
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

Contract #

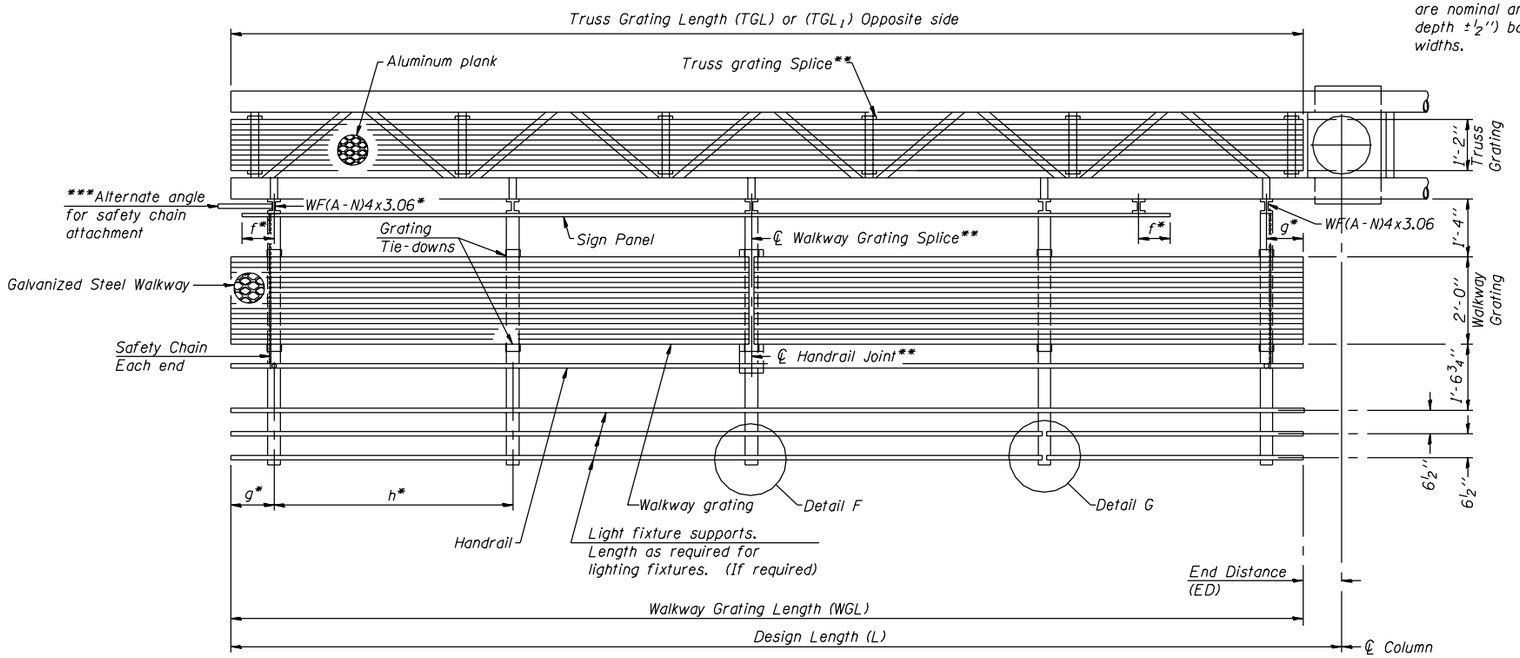


TYPICAL FRONT ELEVATION
With lights and handrail omitted for clarity.



PLAN
WALKWAY AND HANDRAIL SKETCH
(Road plan beneath truss varies)

Walkway and truss grating dimensions are nominal and may vary (width ±½", depth ±½") based on available standard widths.



Structure Number	Station	WGL	ED	TGL	WGL 1	ED 1	TGL 1

Notes:
* Space walkway brackets WF(A-N)4x3.06 and sign brackets WF(A-N)4x1.79 for efficiency and within limits shown:

f = 12" maximum, 4" minimum (End of sign to ℄ of nearest bracket)
g = 12" maximum, 4" minimum (End of walkway to ℄ of nearest bracket)
h = 6'-0" maximum (℄ to ℄ sign and/or walkway support brackets, WF(A-N)4x1.79 or WF(A-N)4x3.06)

*** If walkway bracket at safety chain location is behind sign, add angle to bracket. See alternate safety chain attachment on base sheet OSF-A-8.

For details of sign placement, sign/walkway brackets, truss and walkway gratings, grating splices and Section B-B, see Base Sheet OSF-A-7S.
For details of handrail, handrail joint, safety chain and Details F and G, see Base Sheet OSF-A-8.

SECTION A-A

Handrail and walkway grating shall span a minimum of three brackets between splices.
**Use and location of handrail joint or grating splices are optional, based on lengths needed and material availability.

Truss grating to facilitate inspection shall run full length of cantilevers. Cost of truss grating is included in "Overhead Sign Structure Butterfly".

$$TGL = L - \left(\frac{\text{Post O.D.}}{2} + 6''\right)$$

BRACKET TABLE

WF(A-N)4x1.79 or WF(A-N)4x3.06
ASTM B308, Alloy 6061-T6

Sign Width		Number Brackets Required
Greater Than	Less Than or Equal To	
	8'-0"	2
8'-0"	14'-0"	3
14'-0"	20'-0"	4
20'-0"	26'-0"	5
26'-0"	32'-0"	6

NUMBER	REVISION	DATE

BUTTERFLY SIGN STRUCTURES
ALTERNATE STEEL WALKWAY DETAILS
ALUMINUM TRUSS & STEEL POST

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

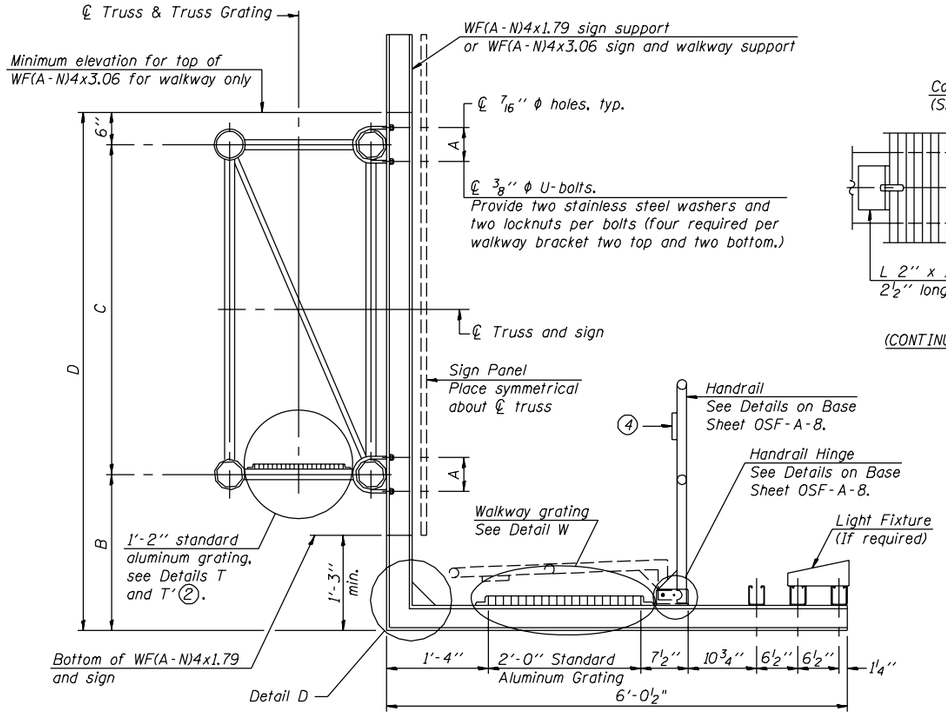
ENGINEER OF BRIDGES AND STRUCTURES

OSF-A-6S 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

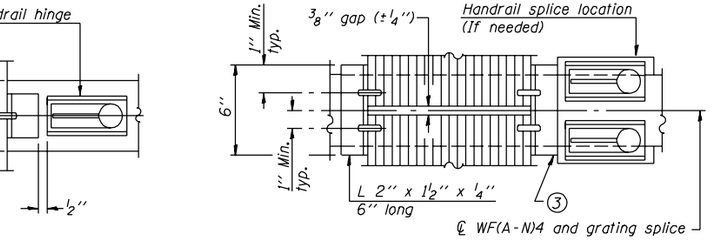
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS
Contract #



SECTION B-B

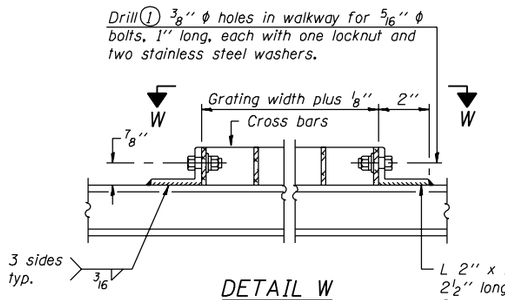
DETAIL T
(Truss grating at horizontal)



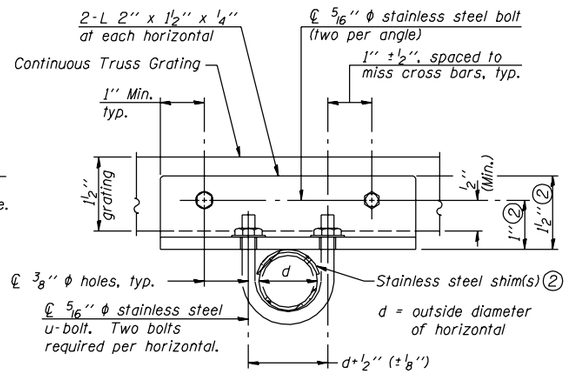
(CONTINUOUS WALKWAY GRATING)

(AT WALKWAY GRATING SPLICE)

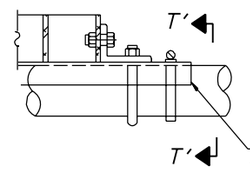
SECTION W-W



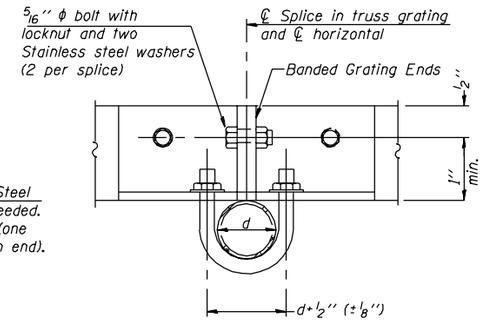
DETAIL W
(Walkway grating)



SECTION T-T



DETAIL T'
(Truss grating splice)
Details not shown same as Detail T. Alternate materials may be used subject to the Engineer's review and approval.



SECTION T'-T'

SPECIFICATIONS FOR STANDARD ALUMINUM GRATING

Main Bearing Bars (MBB) shall be 3/16" x 1½" on 1 3/16" centers and conform to ASTM B211 Alloy 6061-T6.

Cross bars (CB) shall be 3/16" x 1½" on 4" centers and conform to ASTM B221 Alloy 6063-T5 or 6061-T6.

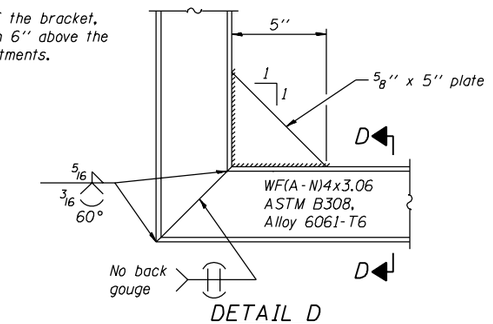
OR

Aluminum Grating with modified "1" sections for main bearing bars shall meet the following requirements:

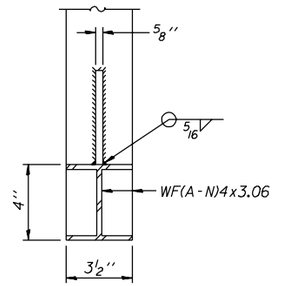
Main bars shall conform to ASTM B221 Alloy 6061-T6 and have a minimum section modulus equal to 0.0705 in.^{3} per bar, a depth of 1½", spaced on 1 3/16" centers.

Cross bars shall conform to ASTM B221 Alloy 6063-T5 or T-42 and spaced on 4" centers.

Sign shall be even with the top of the bracket, but it may extend to no more than 6" above the top of the bracket for field adjustments.



DETAIL D



SECTION D-D

NUMBER	REVISION	DATE

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200
EXAMINED
ENGINEER OF BRIDGE DESIGN
PASSED
ENGINEER OF BRIDGES AND STRUCTURES

① Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.

② Stainless steel shims shall be placed as shown in Detail T if needed to compensate for alignment variations between horizontal and diagonal pipes beyond adjustment provided by angles. Thicker shims may be used subject to shims performing properly.

③ If Handrail Joint present, weld angle to WF(A-N)4 and ¼" extension bars. (See Base Sheet OSF-A-8)

④ PL ⅛" x ½" x 2" welded to handrail posts to protect locations that contact grating.

⑤ Tube to grating gap may very from 0 to 1/2" max. to align walkway, allow for camber, etc.

Structure Number	Station	A	B	C	D

BUTTERFLY SIGN STRUCTURES
WALKWAY DETAILS
ALUMINUM TRUSS & STEEL POST

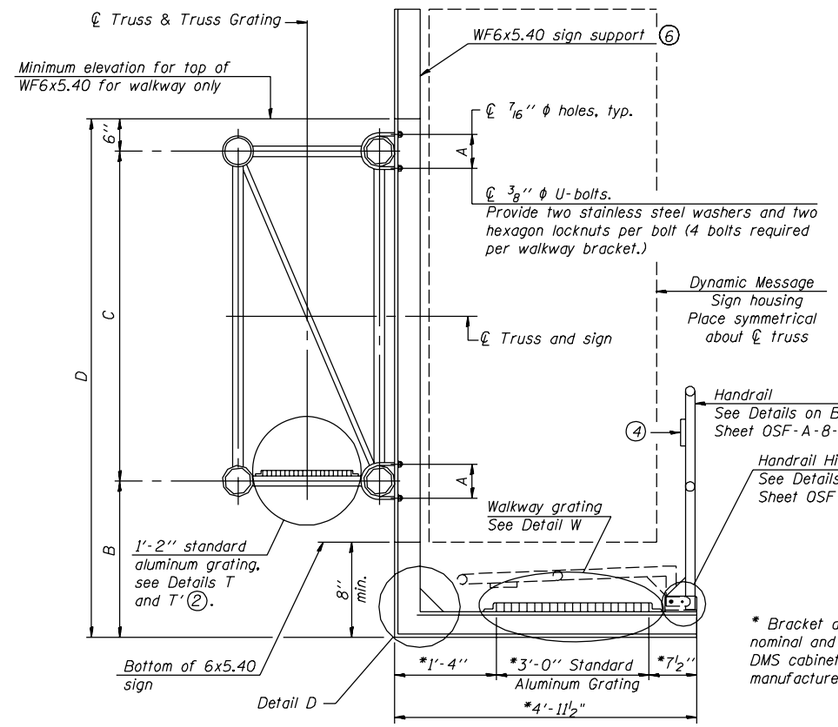
OSF-A-7 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

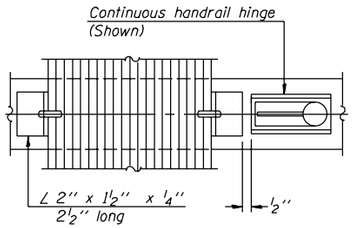
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

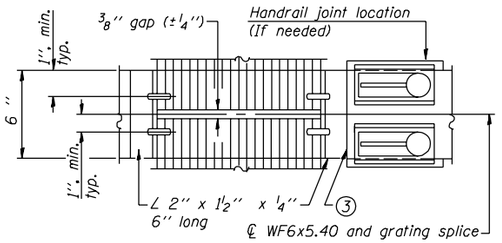
Contract #



SECTION B-B



(CONTINUOUS WALKWAY GRATING)



(AT WALKWAY GRATING SPLICE)

SPECIFICATIONS FOR STANDARD ALUMINUM GRATING

Main Bearing Bars (MBB) shall be 3/16" x 1 1/2" on 1 3/16" centers and conform to ASTM B211 Alloy 6061-T6.

Cross bars (CB) shall be 3/16" x 1 1/2" on 4" centers and conform to ASTM B221 Alloy 6063-T5 or 6061-T6.

OR

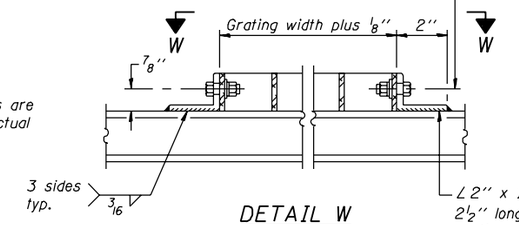
Aluminum Grating with modified "I" sections for main bearing bars shall meet the following requirements:

Main bars shall conform to ASTM B221 Alloy 6061-T6 and have a minimum section modulus equal to 0.0705 in.^{3} per bar, a depth of 1 1/2", spaced on 1 3/16" centers.

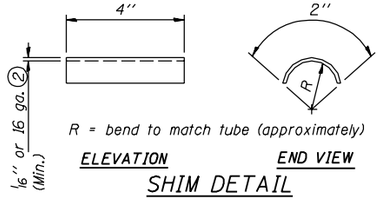
Cross bars shall conform to ASTM B221 Alloy 6063-T5 or T-42 and spaced on 4" centers.

SECTION W-W

Drill (1) 3/8" ϕ holes in walkway for 5/16" ϕ stainless steel bolts, 1" long, each with one stainless steel locknut and 2 stainless steel flat washers.

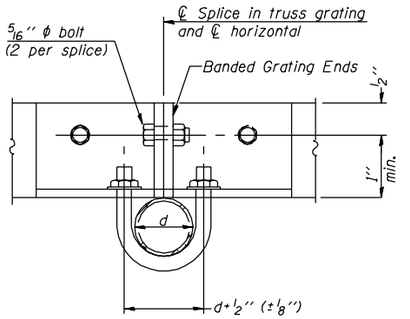


DETAIL W
(Walkway grating)



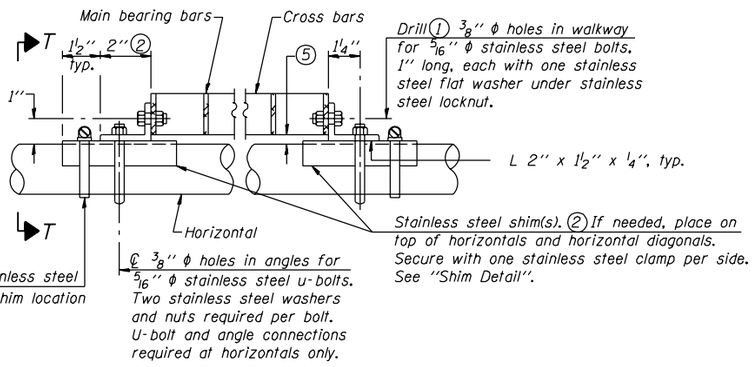
SHIM DETAIL

DETAIL T'
(Truss grating splice)
Details not shown same as Detail T.
Alternate materials may be used subject to the Engineer's review and approval.

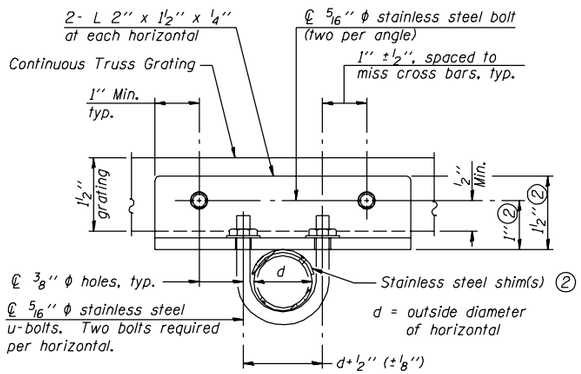


SECTION T'-T'

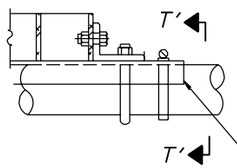
* Bracket and grating dimensions are nominal and will vary based on actual DMS cabinet dimensions plus manufacturers mounting device.

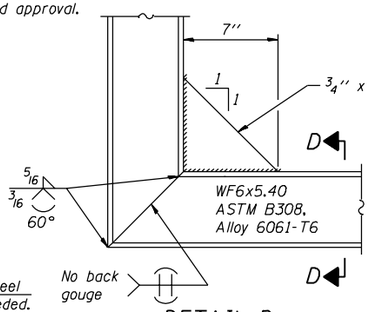


DETAIL T
(Continuous Truss grating)

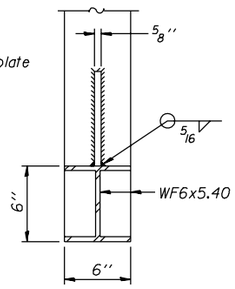


SECTION T-T





DETAIL D



SECTION D-D

NUMBER	REVISION	DATE

(1) Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.

(2) Stainless steel shims shall be placed as shown in Detail T if needed to compensate for alignment variations between horizontal and diagonal pipes beyond adjustment provided by angles. Thicker shims may be used subject to shims performing properly.

(3) If Handrail Joint present, weld angle to WF(A-N)4 and 1/4" extension bars. (See Base Sheet OSF-A-8.)

(4) ℄ 1/8" x 1/2" x 2" welded to handrail posts to protect locations that contact grating.

(5) Tube to grating gap may vary from 0 to 1/2" max. to align walkway, allow for camber, etc.

(6) Cabinet manufacturer must design and supply hardware for connection of cabinet to WF6's. Bolts must be stainless steel or hot dip galvanized high strength per IDOT specifications.

Structure Number	Station	A	B	C	D

BUTTERFLY SIGN STRUCTURES
ALTERNATE WALKWAY DETAILS FOR DMS
ALUMINUM TRUSS & STEEL POST

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

\- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

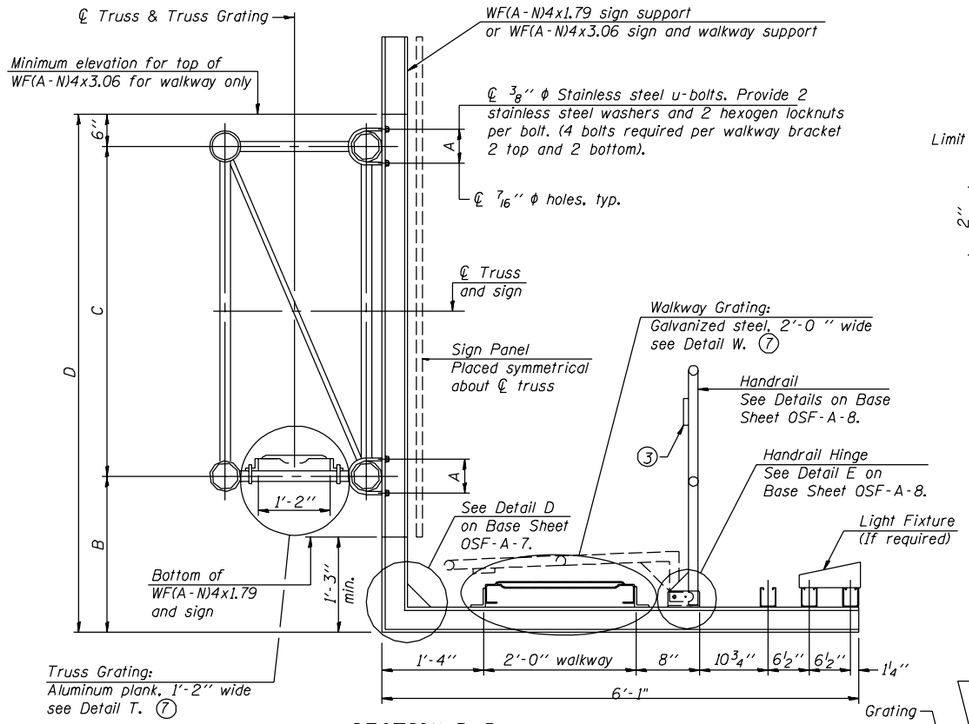
OSF-A-7-DMS 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

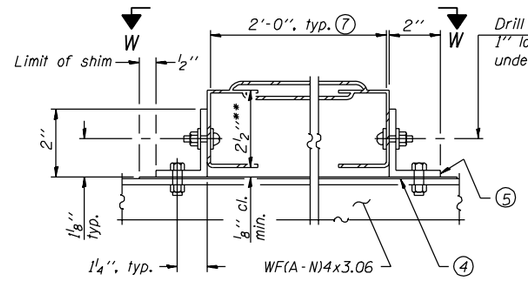
SHEET NO. - - SHEETS

Contract #

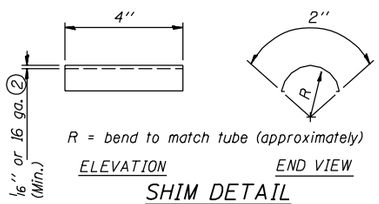


SECTION B-B

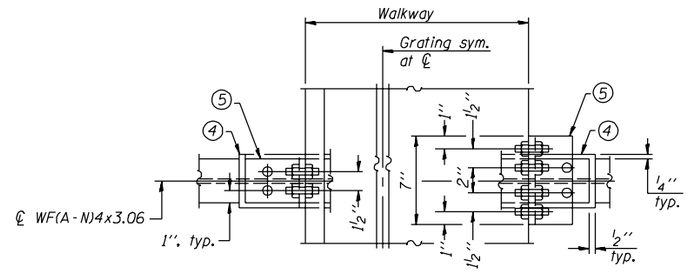
Sign shall be even with the top of the bracket. but it may extend no more than 6'' above the top of the bracket for field adjustments.



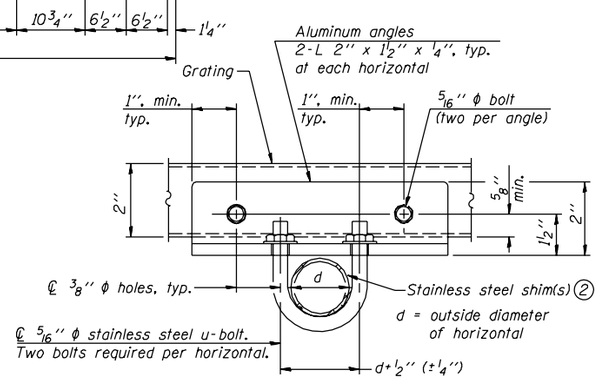
DETAIL W
GALVANIZED STEEL WALKWAY GRATING



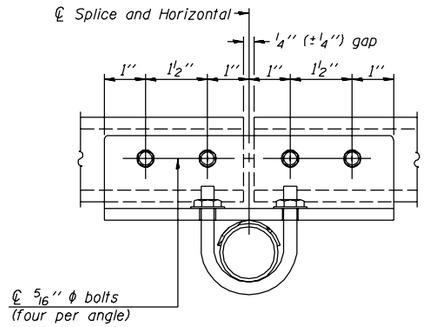
SHIM DETAIL



WALKWAY GRATING CONTINUOUS AT WALKWAY GRATING SPLICE

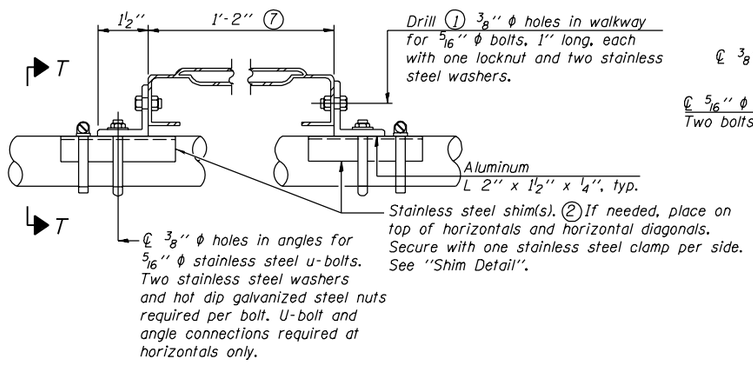


SECTION T-T
(Truss Grating Continuous)



SECTION T-T
(Truss Grating Splice)

Alternate splice details and locations may be used subject to the Engineer's review and approval.



DETAIL T
(Truss Grating at Horizontal)

(1) Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.

(2) When truss grating must be spliced, use suggested details or other methods in accord with grating manufacturer's recommendation and subject to the Engineer's review and approval.

(3) ℄ 1/8'' x 1/2'' x 2'' welded to handrail posts to protect locations that contact grating.

(4) 1/16'' (or 16 ga.) x 2 1/2'' x 4'' stainless steel shim adhered to top of WF(A-N)4x3.06 beneath each galvanized angle, typ. Adhesives for shims shall be suitable for materials joined and full exposure conditions.

(5) Galvanized steel L2'' x 2'' x 1/4'', 3 1/2'' long with continuous grating 7'' long at grating splice.

(6) Details shown are considered equal alternatives to Aluminum Walkway Details and may be substituted by Contractor at no charge in contract cost.

(7) Perforated or expanded metal grating providing a skid resistant (non-serrated) surface and capable of supporting a 500 pound concentrated load with a 6'-0'' clear span. Walkway and truss grating dimensions are nominal and may vary (width ±1/2'', depth ±1/2'') based on available standard sizes. Cut ends of grating shall be free of burrs or hazardous projections and coated with zinc-rich primer or equivalent.

ALUMINUM TRUSS GRATING

Structure Number	Station	A	B	C	D

BUTTERFLY SIGN STRUCTURES
ALTERNATE WALKWAY DETAILS

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

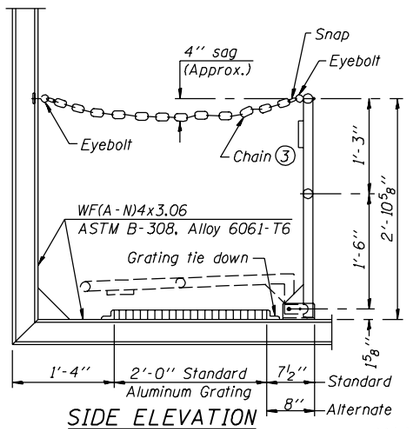
OSF-A-7S 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

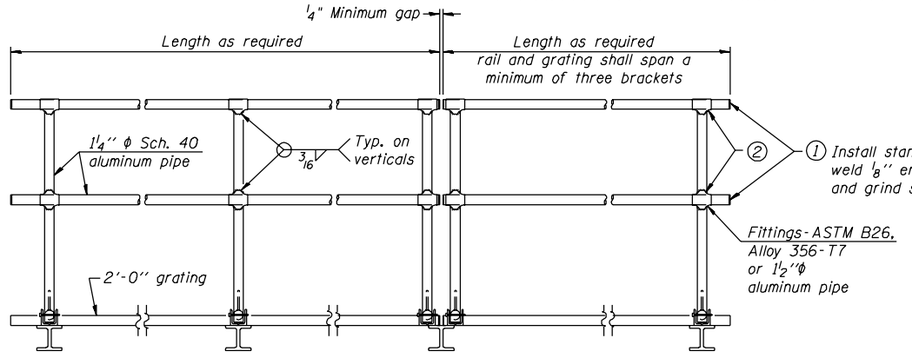
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. - - SHEETS

Contract #

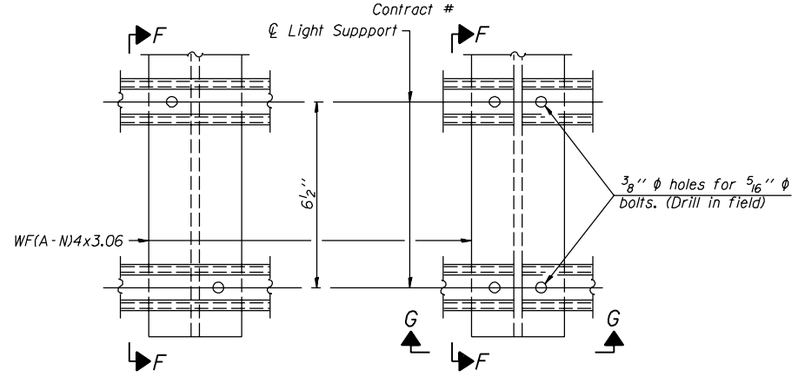


SIDE ELEVATION
(Showing Safety Chain W/O Sign)



FRONT ELEVATION

(2) Horizontal handrail member shall be continuous thru fitting. Provide 7/16" ϕ hole in fitting for 3/8" ϕ bolt. Field drill 7/16" ϕ hole in horizontal rail member. Provide locknut and two stainless steel washers for bolt. (Use 5/16" eyebolts in 7/16" ϕ holes on top rail at ends only.)

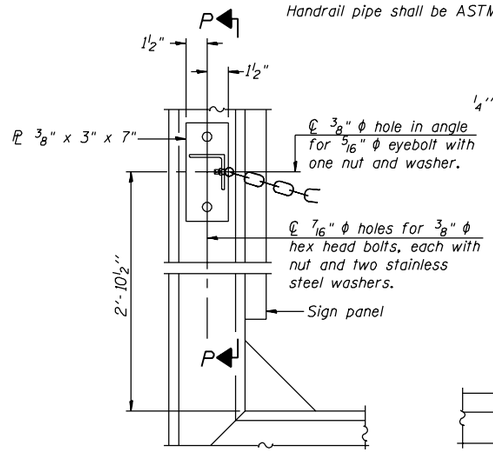


DETAIL F

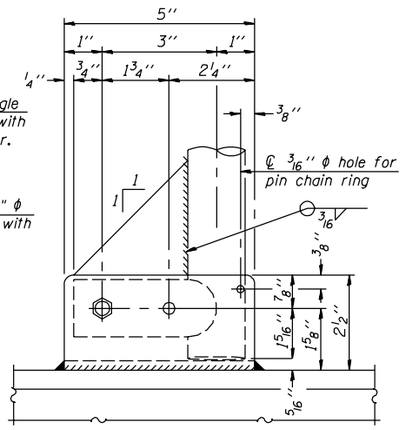
DETAIL G

HANDRAIL DETAILS

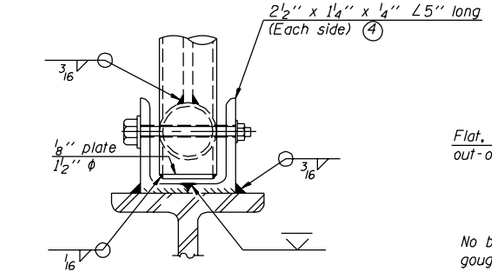
Handrail pipe shall be ASTM B241 or B429, Alloy 6063-T6 or Alloy 6061-T6.



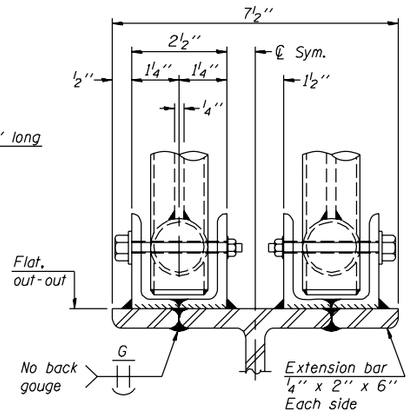
ALTERNATE SAFETY CHAIN ATTACHMENT
(With Sign Present)
Items not shown same as "Side Elevation" of "Handrail Details"



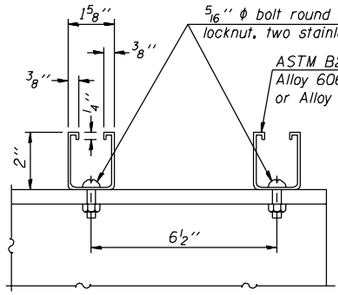
SIDE ELEVATION



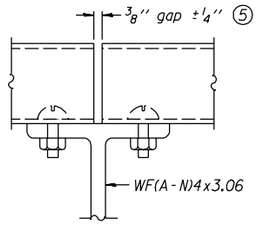
FRONT ELEVATION
Details not shown same as "ELEVATION" at right.



ELEVATION AT HANDRAIL JOINT (4)
Details not shown same as "FRONT ELEVATION"



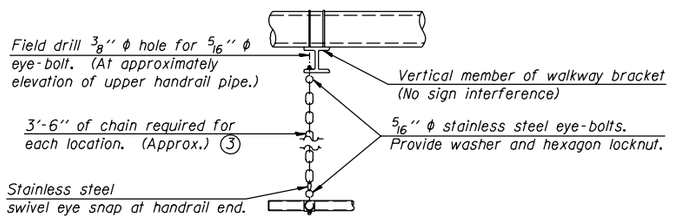
SECTION F-F



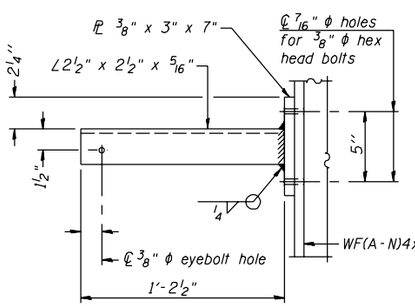
SECTION G-G

LIGHTING FIXTURE MOUNTS (IF REQUIRED)

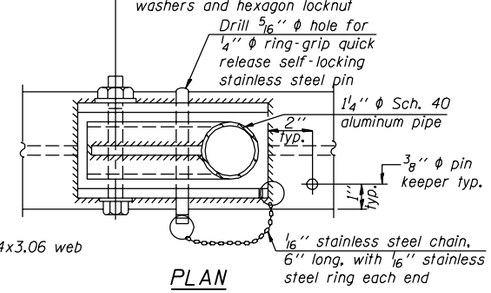
(5) Field cut ends of light support channels shall be free of burrs or hazardous projections and coated with zinc-rich primer or equivalent.



SAFETY CHAIN
One required for each end of each walkway.

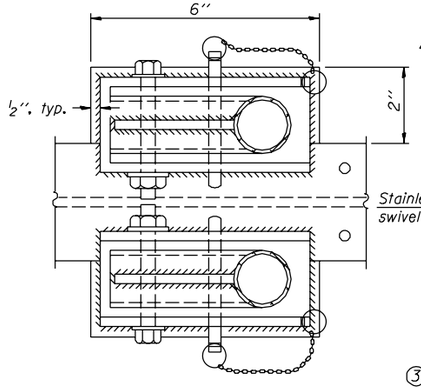


SECTION P-P

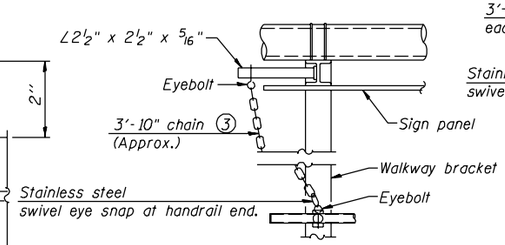


PLAN

DETAIL E HANDRAIL HINGE



PLAN AT HANDRAIL JOINT
Details not shown same as "PLAN"



ALTERNATE SAFETY CHAIN ATTACHMENT
Details not shown similar to "Safety Chain" Details
(Walkway omitted for clarity)

(3) 3/16" type 304L stainless steel chain, approximately 12 links per foot.

(4) Extrusions may be used in lieu of the details shown, with approval of the Engineer.

BUTTERFLY SIGN STRUCTURES
HANDRAIL DETAILS
ALUMINUM TRUSS & STEEL POST

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

OSF-A-8 7/01/2006

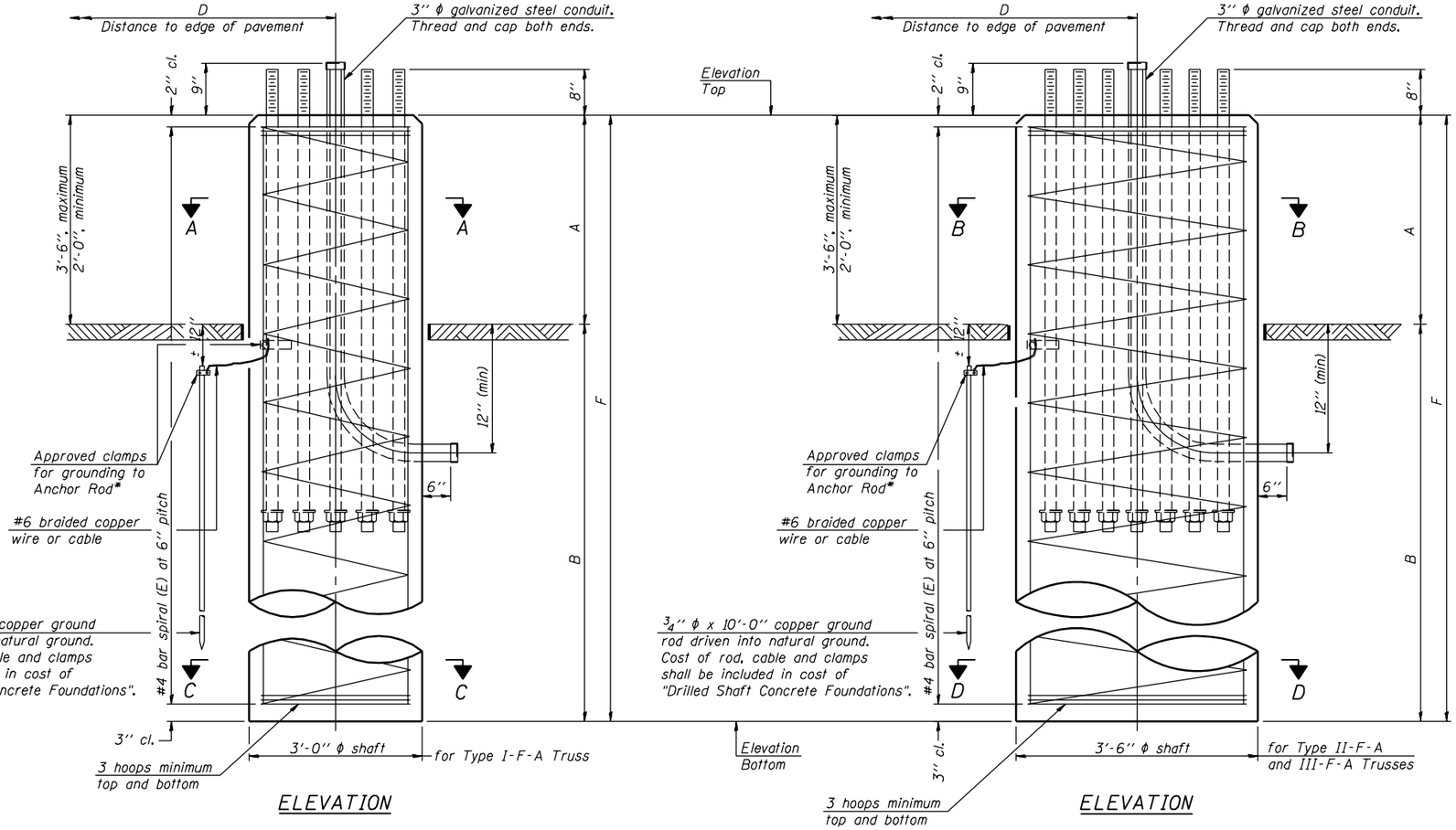
* Grind anchor rod to bright finish at ground clamp location before installing clamp.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

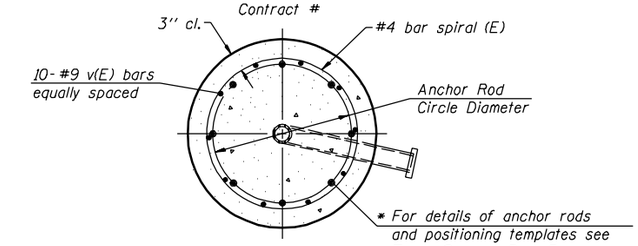
SHEET NO. - - SHEETS

Contract #

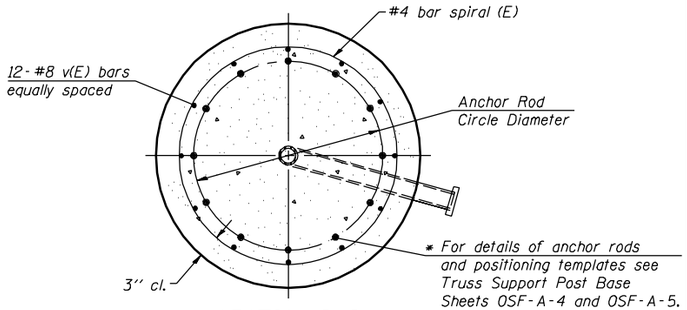


ELEVATION

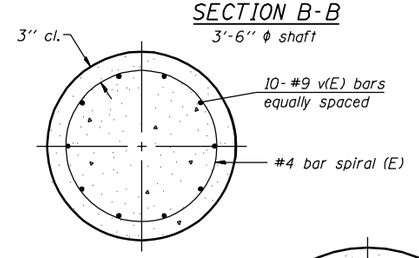
ELEVATION



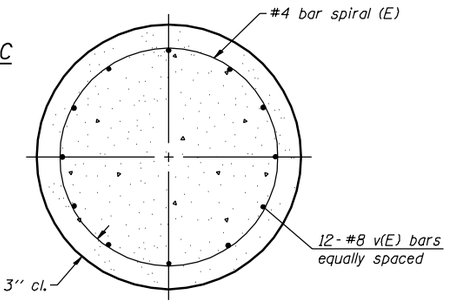
SECTION A-A
3'-0'' ϕ shaft



SECTION B-B
3'-6'' ϕ shaft



SECTION C-C
3'-0'' ϕ shaft



SECTION D-D
3'-6'' ϕ shaft

NOTES:

The foundation dimensions shown in the Foundation Design Table are based on the presence of mostly cohesive soils with an average Unconfined Compressive Strength (Qu) of at least 1.25 tsf, which must be determined by previous soil investigations at the jobsite. When other conditions are indicated, the boring data will be included in the plans and the foundation dimensions shown in the Foundation Data Table will be the result of site specific designs.

If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. If dimensions "B" or "F" are revised by more than 12" by the Contractor, "as-built" plans shall be prepared and submitted to the District Bureau of Operations for future reference.

No sonotubes or decomposable forms shall be used below the lower conduit entrance. Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints. Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Bridge Seat Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

FOUNDATION DATA TABLE

Structure Number	Station	Truss Type	Shaft Diameter	Elevation Top	Elevation Bottom	A	B	F	Class SI Concrete Cubic Yards

FOUNDATION DESIGN TABLE

Truss Type	Post Base Sheet	Maximum CantileverLength (ft)	Maximum Total Sign Area (sq ft)	Shaft Diameter (in)	"B" Depth (ft)	Anchor Rods No.	Anchor Rods Diameter (in)	Anchor Rod Circle Diameter (in)
I-F-A	OSF-A-4	25	200	3.0	17'-6''	8	2	22
II-F-A	OSF-A-5	30	400	3.5	22'-0''	12	2	30
III-F-A	OSF-A-5	35	400	3.5	24'-0''	12	2	30

BUTTERFLY SIGN STRUCTURES
DRILLED SHAFT
ALUMINUM TRUSS & STEEL POST

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

\- 200

EXAMINED

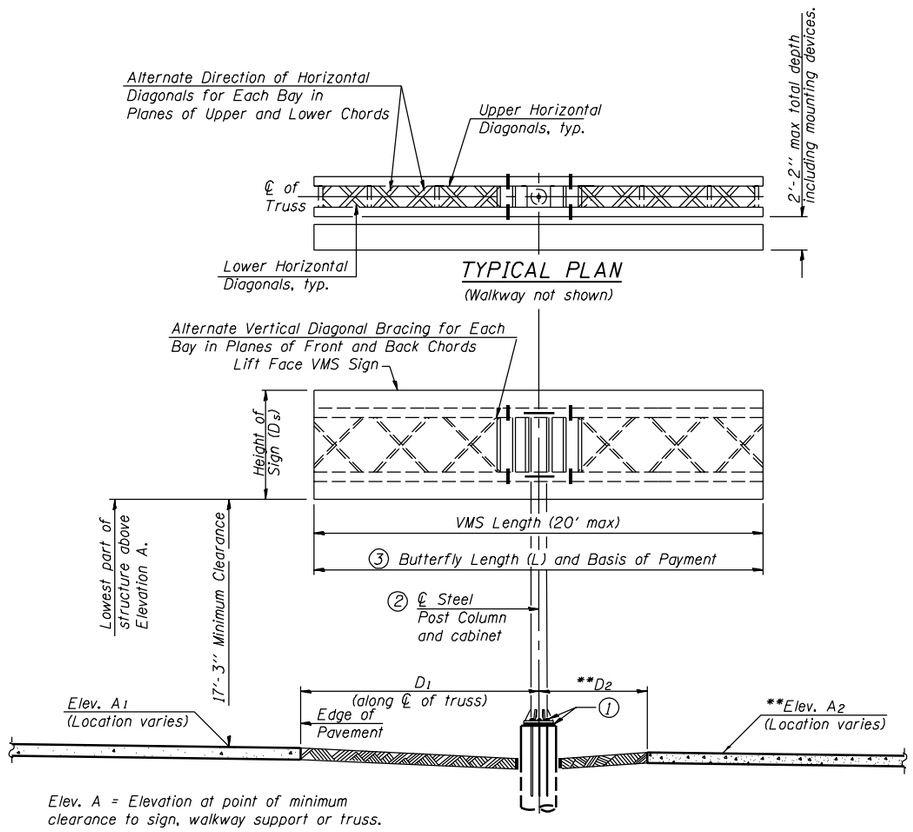
ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

OSF-A-9 7/01/2006



TYPICAL ELEVATION

Looking in Direction of Traffic

** Elevation A_2 and dimension D_2 not used when butterfly structure is mounted on right side of the shoulder.

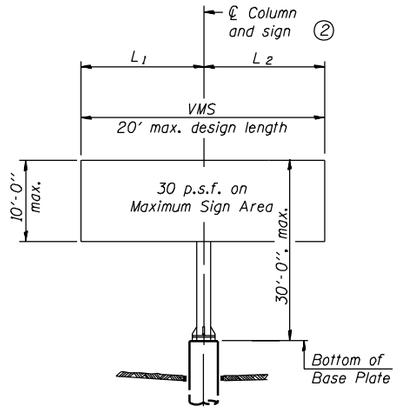
Sign support structures may be subject to damaging vibrations and oscillations when signs are not in place during erection or maintenance of the structure. To avoid these vibrations and oscillations, consideration should be given to attaching temporary blank sign panels to the structure.

Structure Number	Station	③ Total Butterfly Length (L)	Elev. A_1	Elev. A_2	Dim. D_1	Dim. D_2	D_s	Total Sign Area

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TRUSS TYPE	MAXIMUM TOTAL VMS AREA
I-F-A	200 Sq. Ft.

Maximum VMS (Variable Message Sign) Weight = 2500 LB.



DESIGN WIND LOADING DIAGRAM

Parameters shown are basis for I.D.O.T. Standards. Installations not within dimensional limits shown require special analysis for all components.

NUMBER	REVISION	DATE

① After adjustments to level truss and insure adequate vertical clearance, all top and bottom leveling nuts shall be tightened against the base plate with a minimum torque of 200 lb.-ft. Stainless steel mesh shall then be placed around the perimeter of the base plate. Secure to base plate with stainless steel banding.

② Centerline sign must be located at centerline of column.

③ Total truss length to match VMS length.

Note:
Trusses shall be shipped individually with adequate provision to prevent detrimental motion during transport. This may require ropes between horizontals and diagonals or energy dissipating (elastic) ties to the vehicle. The contractor is responsible for maintaining the configuration and protection of the trusses.

TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL
OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE I-F-A	Foot	
DRILLED SHAFT CONCRETE FOUNDATIONS	Cu. Yds.	

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. - - SHEETS

Contract #

GENERAL NOTES

DESIGN: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. ("AASHTO Specifications")

CONSTRUCTION: Current (at time of letting) Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, Supplemental Specifications and Special Provisions. ("Standard Specifications")

LOADING: 90 M.P.H. WIND VELOCITY
WIND LOADING: 30 p.s.f. normal to DMS Cabinet Area and truss elements not behind sign Loading Diagram.
WALKWAY LOADING: Dead load plus 500 lbs. concentrated live load.

DESIGN STRESSES
FIELD UNITS
f'_c = 3,500 p.s.i.
fy = 60,000 p.s.i. (reinforcement)

WELDING: All welds to be continuous unless otherwise shown. All welding to be done in accordance with current AWS D1.1 and D1.2 Structural Welding Codes (Steel and Aluminum) and the Standard Specifications.

MATERIALS: Aluminum Alloys as shown throughout plans. All Structural Steel Pipe shall be ASTM A53 Grade B with a minimum yield of 35,000 p.s.i., or A500 Grade B or C with a minimum yield of 46,000 p.s.i. If A500 pipe is substituted for A53, then the outside diameter shall be as detailed and wall thickness greater than or equal to A53.
All Structural Steel Plates and Shapes shall conform to AASHTO M270 Gr. 36, Gr. 50 or Gr. 50W* (M183, M223 Gr. 50, or M222). Stainless steel for shims, sleeves and handhole covers shall be ASTM A240, Type 302 or 304, or another alloy suitable for exterior exposure and acceptable to the Engineer.
The steel pipe and stiffening ribs at the base plate for the column shall have a minimum longitudinal Charpy V-Notch (CVN) energy of 15 lb.-ft. at 40° F. (Zone 2) before galvanizing.

FASTENERS FOR ALUMINUM TRUSSES: All bolts noted as "high strength" must satisfy the requirements of AASHTO M164 (ASTM A325), or approved alternate, and must have matching lock nuts. Threaded studs for splices (if Members interfere) must satisfy the requirements of ASTM A449, ASTM A193, Grade B7, or approved alternate, and must have matching lock nuts. Bolts and lock nuts not required to be high strength must satisfy the requirements of ASTM A307. All bolts and lock nuts must be hot dip galvanized per AASHTO M232. The lock nuts must have nylon or steel inserts. A stainless steel flat washer conforming to ASTM A240 Type 302 or 304, is required under both head and nut or under both nuts where threaded studs are used. High strength bolt installation shall conform to Article 505.04 (f) (2)d of the IDOT Standard Specifications for Road and Bridge Construction. Rotational capacity ("ROCAP") testing of bolts will not be required.

U-BOLTS AND EYEBOLTS: U-Bolts and Eyebolts must be produced from ASTM A276 Type 304, 304L, 316 or 316L, Condition A, cold finished stainless steel, or an equivalent material acceptable to the Engineer. All nuts for U-Bolts and Eyebolts must be lock nuts equivalent to ASTM A307 with nylon or steel inserts and hot dip galvanized per AASHTO M232. A stainless steel flat washer conforming to ASTM A240, Type 302 or 304, is required under each U-Bolt and Eyebolt lock nut.

GALVANIZING: All Steel Grating, Plates, Shapes and Pipe shall be Hot Dip Galvanized after fabrication in accordance with AASHTO M111. Painting is not permitted.

ANCHOR RODS: Shall conform to AASHTO M314 Gr. 55 with a minimum Charpy V-Notch (CVN) energy of 15 lb.-ft. at 10° F.

CONCRETE SURFACES: All concrete surfaces above an elevation 6" below the lowest final ground line at each foundation shall be cleaned and coated with Bridge Seat Sealer in accordance with the Standard Specifications.

REINFORCEMENT BARS: Reinforcement Bars designated (E) shall be epoxy coated in accordance with the Standard Specifications.

* If M270 Gr. 50W (M222) steel is proposed, chemistry for plate to be used shall first be approved by the Engineer as suitable for galvanizing and welding.

BUTTERFLY SIGN STRUCTURES
PLAN & ELEVATION FOR FRONT ACCESS VMS
ALUMINUM TRUSS & STEEL POST

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

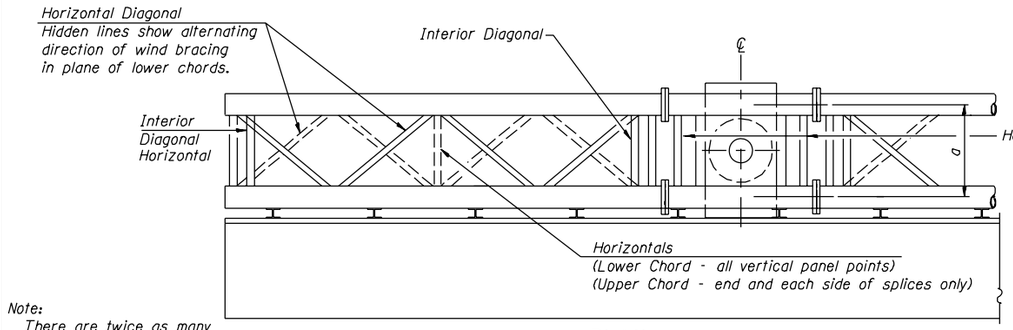
OSF-A-1-VMS 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

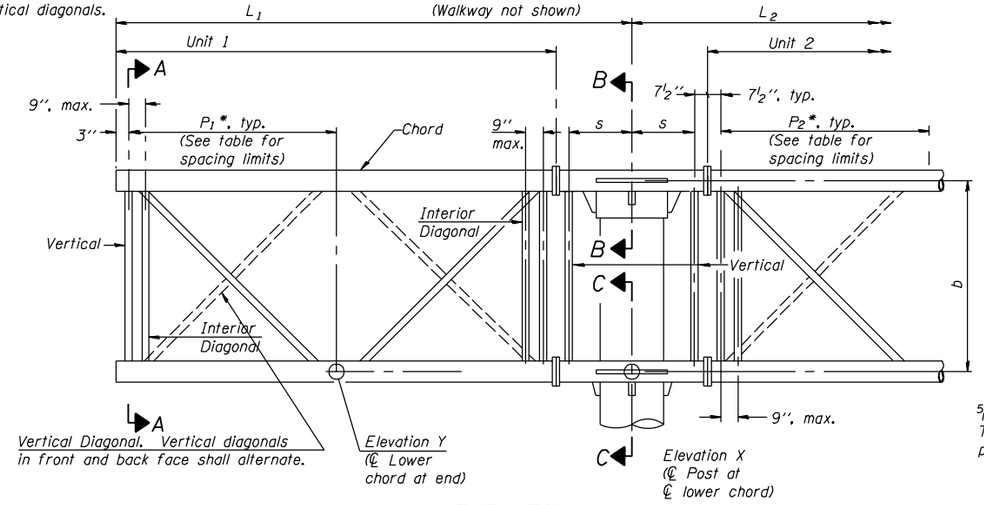
SHEET NO. -
- SHEETS

Contract #



Note:
There are twice as many horizontal diagonals as there are vertical diagonals.

PLAN
(Walkway not shown)

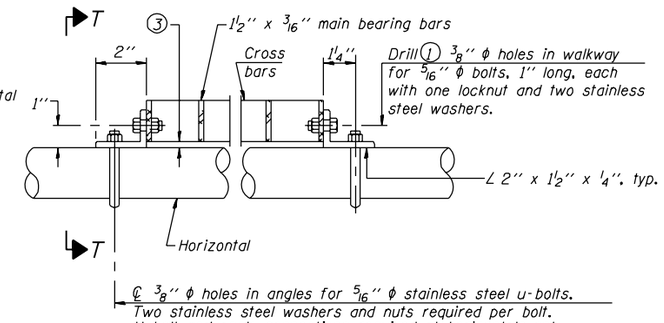


ELEVATION
(Sign omitted for clarity)

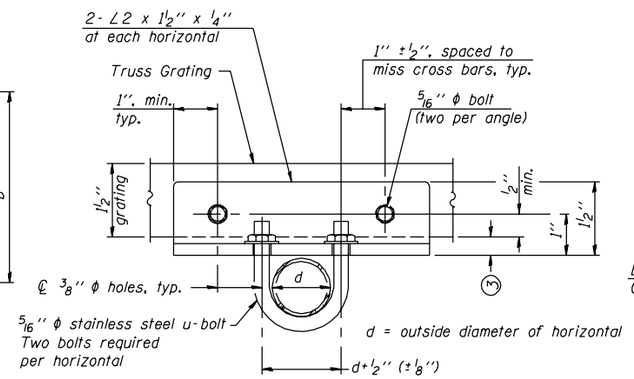
TYPICAL TRUSS UNIT

For Section B-B and Section C-C, see Base Sheet OSF-A-3-VMS.

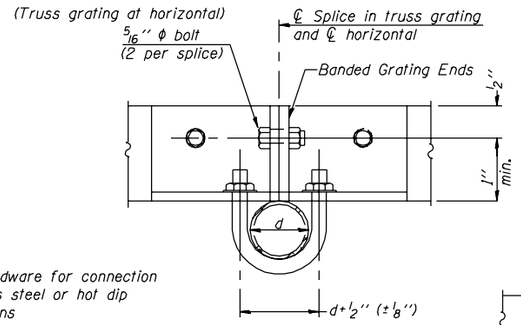
Structure Number	Station	Truss Type	L_1	L_2	Number of Panels Unit 1	Panel Length (P_1)*	Number of Panels Unit 2	Panel Length (P_2)*
		I-F-A			2		2	



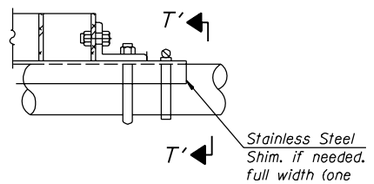
DETAIL T



SECTION T-T

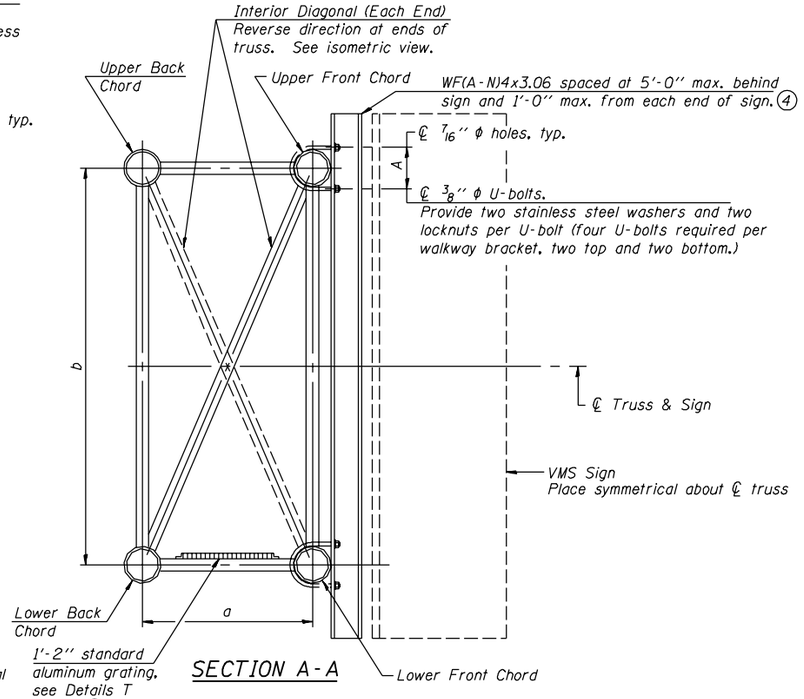


SECTION T'-T'



DETAIL T'

(Truss grating splice)
Details not shown same as Detail T.
Alternate materials may be used subject to the Engineer's review and approval.



SECTION A-A

SPECIFICATIONS FOR STANDARD ALUMINUM GRATING

Main Bearing Bars (MBB) shall be 3/16" x 1½" on 1 3/16" centers and conform to ASTM B211 Alloy 6061-T6.

Cross bars (CB) shall be 3/16" x 1½" on 4" centers and conform to ASTM B221 Alloy 6063-T5 or 6061-T6.

OR

Aluminum Grating with modified "1" sections for main bearing bars shall meet the following requirements:

Main bars shall conform to ASTM B221 Alloy 6061-T6 and have a minimum section modulus equal to 0.0705 $in.^3$ per bar, a depth of 1½", spaced on 1 3/16" centers.

Cross bars shall conform to ASTM B221 Alloy 6063-T5 or T-42 and spaced on 4" centers.

NUMBER	REVISION	DATE

(1) Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.

(2) Stainless steel shims shall be placed as shown in Detail T if needed to compensate for alignment variations between horizontal and diagonal pipes beyond adjustment provided by angles. Thicker shims may be used subject to shims performing properly.

(3) Tube to grating gap may vary from 0 to ½" max. to align walkway, allow for camber, etc.

(4) Sign manufacturer must design and supply hardware for connection of VMS to WF(A-N)4's. Bolts must be stainless steel or hot dip galvanized high strength per IDOT specifications

TRUSS UNIT TABLE

Truss Type	Dimension "a"	Dimension "b"	Dimension "s"	Limits for Panel Spacing (P)*	Up. & Low. Chord O.D.	Up. & Low. Chord Wall	Verticals: Horizontals: Vertical Horizontals: and Interior Diagonals	
I-F-A	24"	54"	16"	36" min. to 48" max.	5"	5/16"	2½"	5/16"

$*P = \frac{L - s - 1'-6"}{\#\ Panels}$

DESIGNED -	
CHECKED -	
DRAWN -	
CHECKED -	

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

OSF-A-2-VMS 7/01/2006

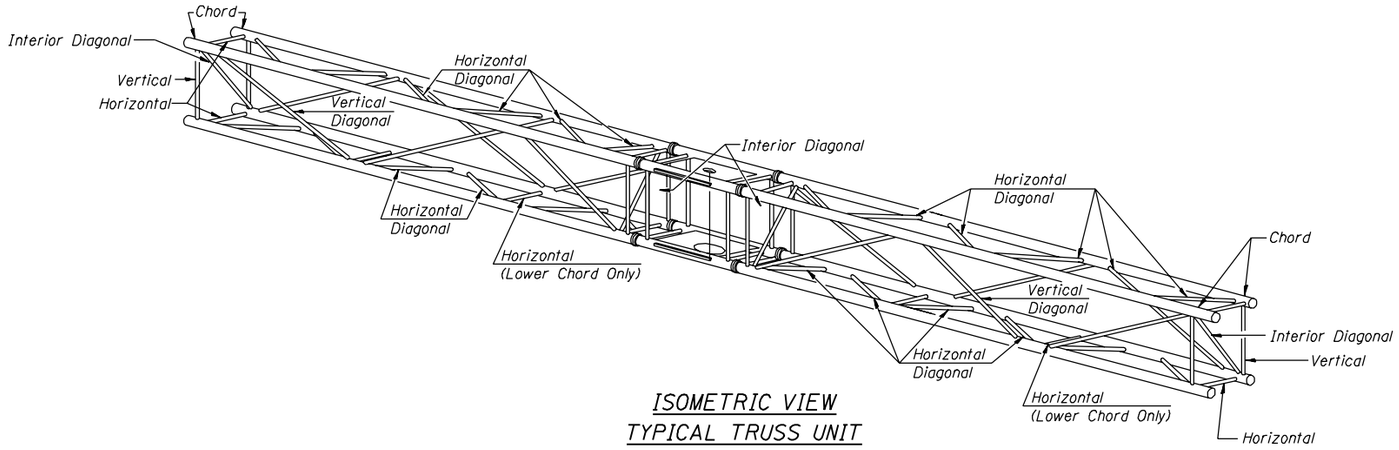
BUTTERFLY SIGN STRUCTURES
TRUSS DETAILS FOR FRONT ACCESS VMS
ALUMINUM TRUSS & STEEL POST

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

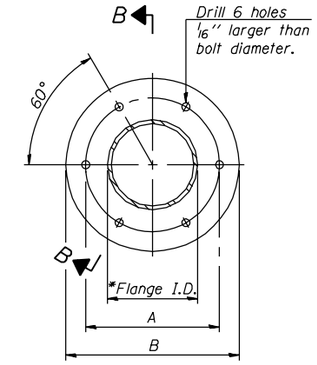
SHEET NO. - - SHEETS

Contract #



ISOMETRIC VIEW TYPICAL TRUSS UNIT

ASTM B221 Alloy 6061 Temper T6

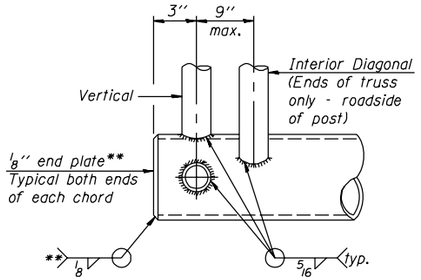


SPLICING FLANGE

ASTM b221, Alloy 6061-T6
or ASTM B209, Alloy 6061-T651

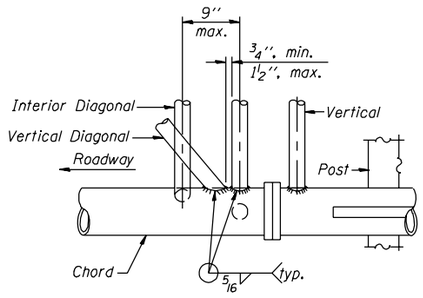
* To fit O.D. of Chord with maximum gap of 1/16''.

(1) Splicing Flanges shall be attached to each truss unit with the truss shop assembled to camber shown. Truss units shall be in proper alignment and flange surfaces shall be shop bolted into full contact before welding. Sufficient external welds or tacks shall be made to secure flanges until remaining welds are made after disassembly. Adjacent flanges shall be "match marked" to insure proper field assembly.

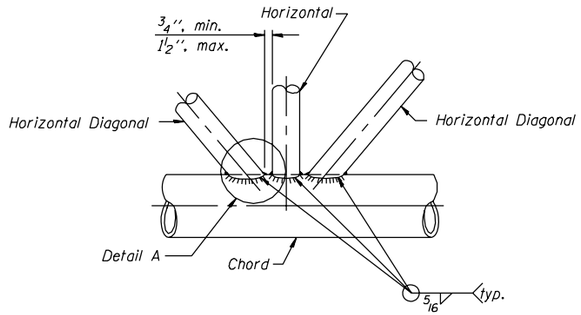


BUTTERFLY END JOINT DETAIL

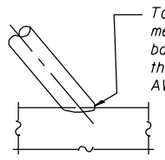
** Contractor may alternatively use standard aluminum drive-fit cap to close ends.



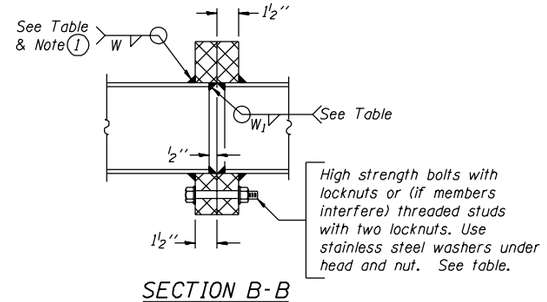
POST END JOINT DETAIL



TRUSS INTERIOR JOINT DETAIL



DETAIL A



SECTION B-B

Truss Type	Bolts Dia.	Weld Sizes W	Weld Sizes W_1	A	B
I-F-A	7/8''	5/16''	1/4''	8 3/4''	11 3/4''

BUTTERFLY SIGN STRUCTURES
TRUSS DETAILS FOR FRONT ACCESS VMS
ALUMINUM TRUSS & STEEL POST

DESIGNED -	
CHECKED -	
DRAWN -	
CHECKED -	

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

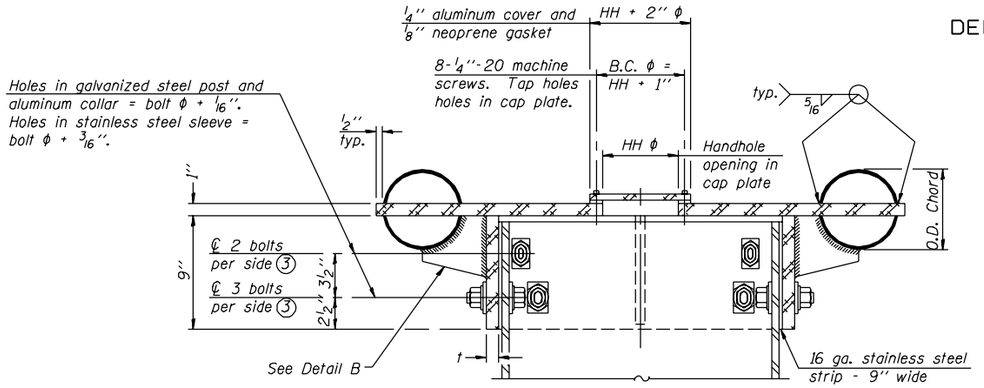
OSF-A-2A-VMS 7/01/2006

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. - - SHEETS

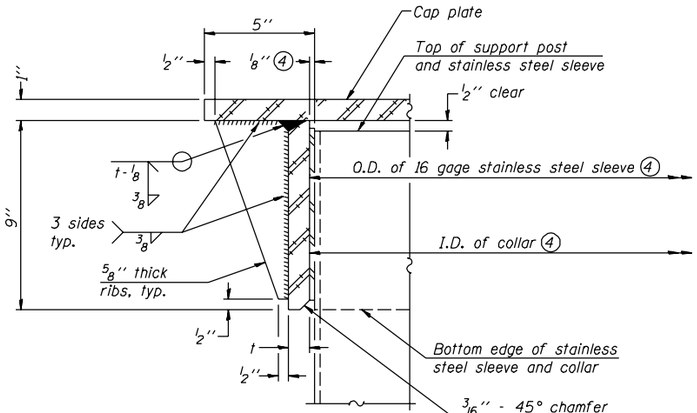
Contract #



SECTION B-B

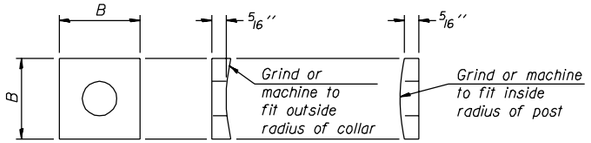
Bolts, washers (including contoured washers), and locknuts shall be stainless steel.

④ Collar I.D. shall be manufactured to correspond to O.D. of actual galvanized post and stainless steel sleeve plus 1/8" (±1/16"). Maximum gap between post and collar at any location equals 1/8" before tightening bolts.



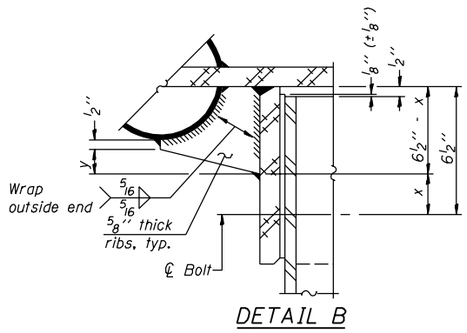
DETAIL A

(Two locations)



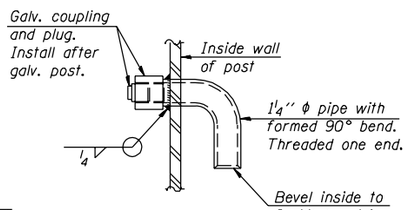
CONTOURED WASHERS

Bolt Size	Contoured Washers	
	Hole Dia.	B
7/8"	1"	2 1/2"

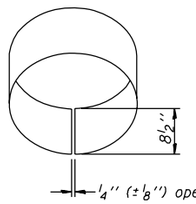


DETAIL B

Two locations
(For details not shown, see Detail C)

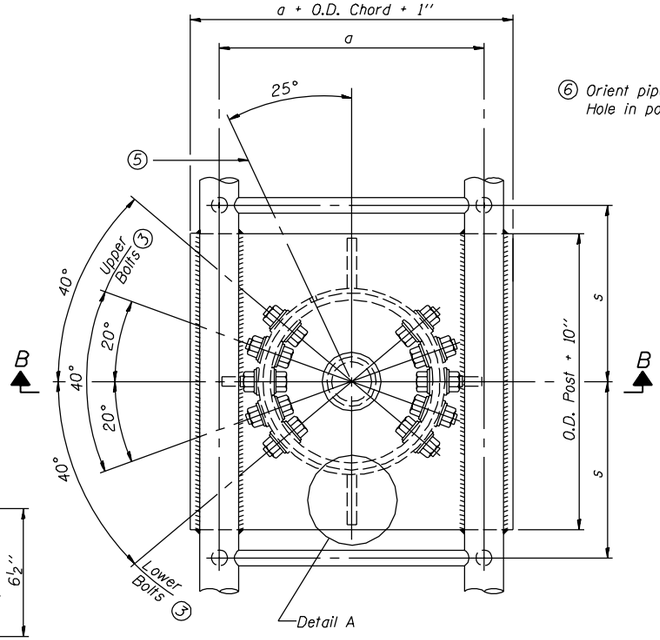


DETAIL D



DETAIL OF STAINLESS STEEL SLEEVE

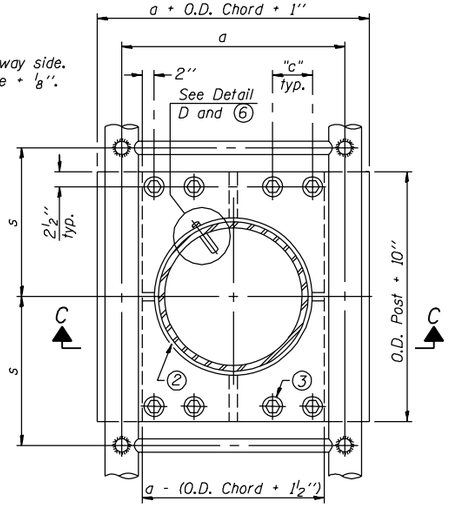
Weld to post after galvanizing.
(Prepare post surface to insure tight, uniform fit and allow welding.)
Welds to be 1 1/2" long at 6" cts. along top edge and at 1/4" opening.



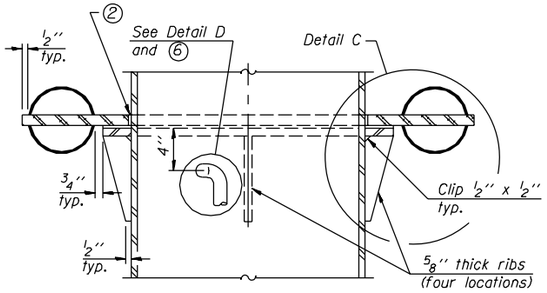
PLAN VIEW - TOP OF COLUMN

⑤ Optional full penetration weld in collar.
(Two locations maximum....(180° apart)....X-ray or UT 100%)

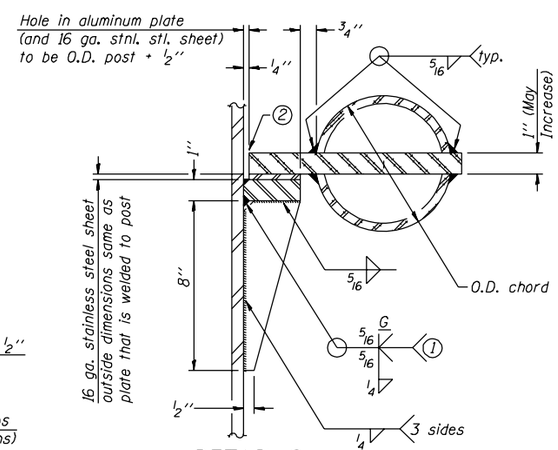
⑥ Orient pipe toward walkway side. Hole in post = O.D. pipe + 1/8".



SECTION THRU POST ABOVE LOWER CHORDS



SECTION C-C



DETAIL C

① Grind top if required to fully seat aluminum plate and stainless steel sheet.

② After tightening lower connection bolts, fill gap with non-hardening, silicone caulk suitable for exterior exposure and acceptable to the Engineer. Cost is included in Overhead Sign Structure Butterfly.

Truss Type	Post Size	Upper & Lower Connection Bolt Diameter (3)	Lower Juncture Bolt Spacing Dimension "c" (3)	Opening in Cap Plate "HH"	Collar Thickness (t)	Side Ribs	
						x	y
I-F-A	16" ϕ (83#/')	7/8"	3 1/4"	8"	5/8"	1 3/4"	2 1/4"

③ Upper and lower connection bolts in collar and bolts at lower chord connection must be high strength with matching locknuts. Connection bolts shall have two stainless steel flat washers each.

NUMBER	REVISION	DATE

DESIGNED -
CHECKED -
DRAWN -
CHECKED -

- 200
EXAMINED
ENGINEER OF BRIDGE DESIGN
PASSED
ENGINEER OF BRIDGES AND STRUCTURES

OSF-A-3-VMS 7/01/2006

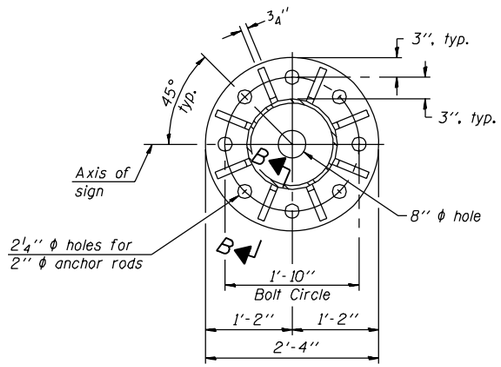
BUTTERFLY SIGN STRUCTURES
JUNCTURE DETAILS FOR FRONT ACCESS VMS
ALUMINUM TRUSS & STEEL POST

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

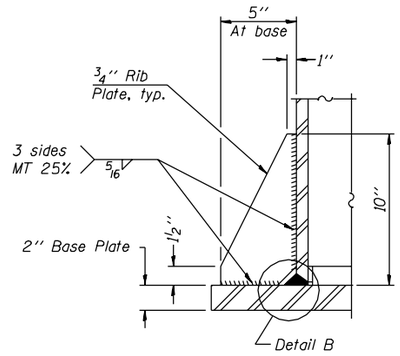
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	-	-		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

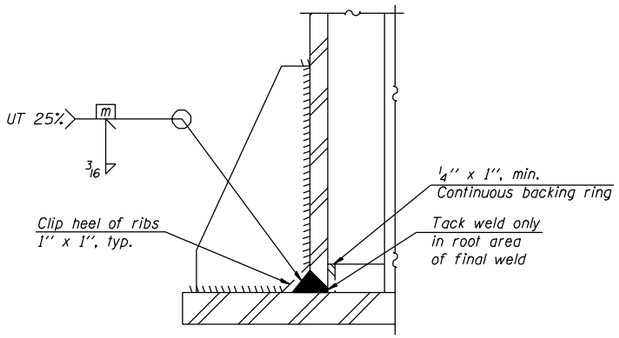
Contract #



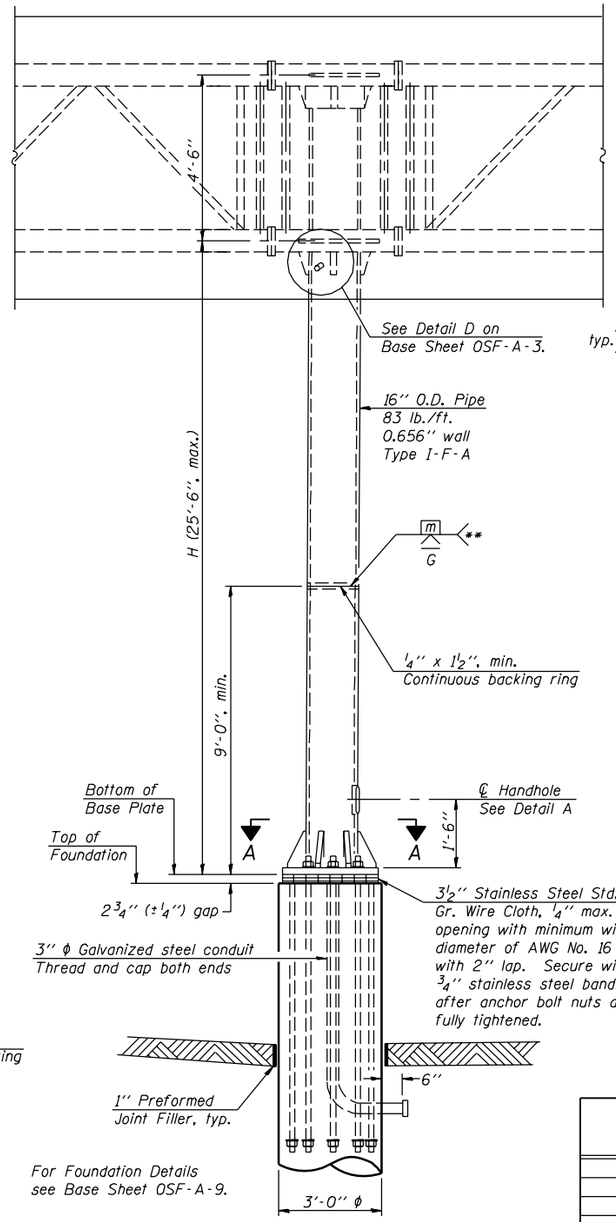
SECTION A-A



SECTION B-B

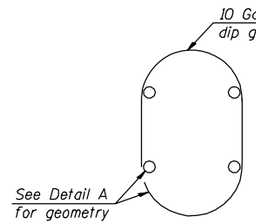


DETAIL B
(Typical rib)

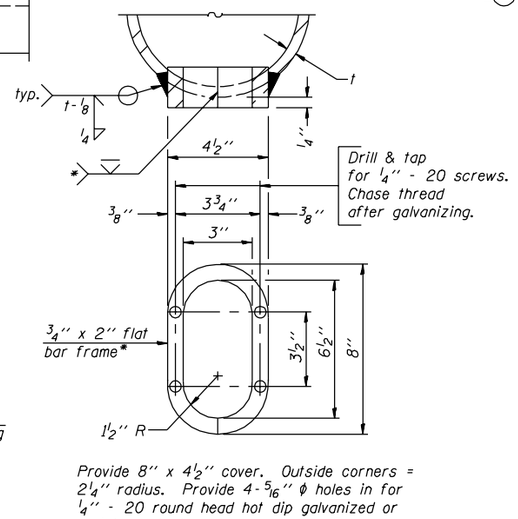


For Foundation Details see Base Sheet OSF-A-9.

FRONT ELEVATION



HANDHOLE COVER



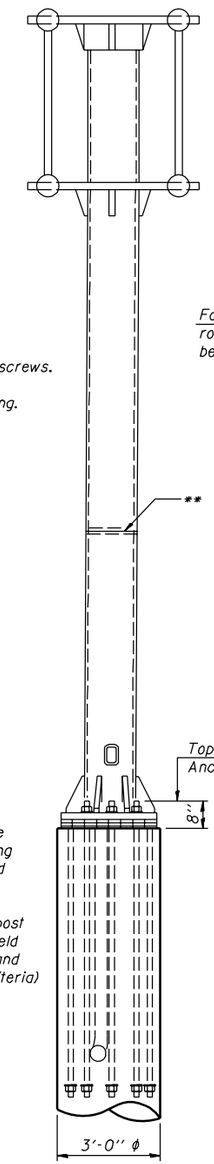
Provide 8" x 4 1/2" cover. Outside corners = 2 1/4" radius. Provide 4-5/16" ϕ holes in for 1/4" - 20 round head hot dip galvanized or stainless steel machine screws. (See cover details.)

DETAIL A

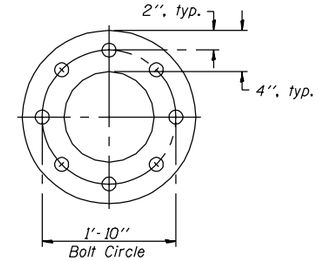
* Bent bars may be butt welded top and bottom or bottom only. In lieu of fabricated handhole frame as shown, may cut from 2" plate (rolling direction vertical). All cut faces to be ground to ANSI Roughness of 500 μin or less.

** Butt welded joint in post is only allowed for post heights (H) over 20 ft. in length. If used, weld procedure must be preapproved by Engineer and joint shall receive 100% RT or UT (tension criteria) at Contractor's expense.

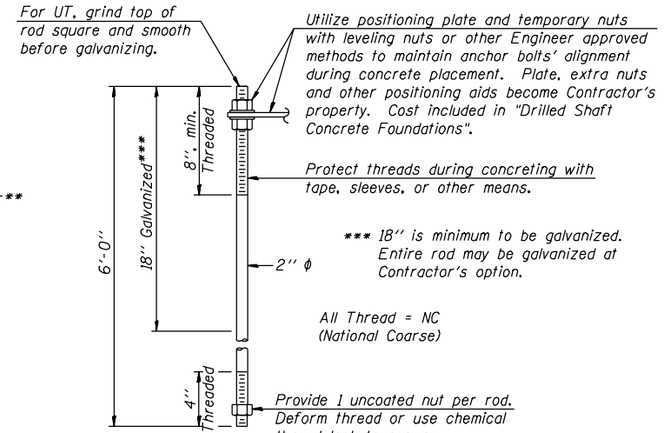
Structure Number	Station	H



SIDE ELEVATION



SUGGESTED POSITIONING PLATE



ANCHOR ROD DETAIL

Anchor rods shall conform to AASHTO M314 Grade 55 and meet Charpy V-Notch (CVN) energy of 15 lb.-ft. at 10° F. before galvanizing. Galvanize the upper 18" (minimum***) and associated M291, Grade A, C or DH heavy hex nuts and hardened washers per AASHTO M232. No welding shall be permitted on rods. Provide an unfinished nut at bottom, a hexagon locknut and washer above base plate and a leveling nut and washer below base plate. Nuts shall each be tightened with 200 lb.-ft. minimum torque against base plate. Before or after threading, but before galvanizing, each anchor rod shall be ultrasonically tested (UT) by a Level II or III inspector, qualified in accord with ANSI guidelines, using a straight beam, 1/2" ϕ 3.5 mhz. transducer, to insure no rejectable flaws exist in the upper 18" (tension criteria). Cost of testing included in Drilled Shaft Concrete Foundations.

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

\- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

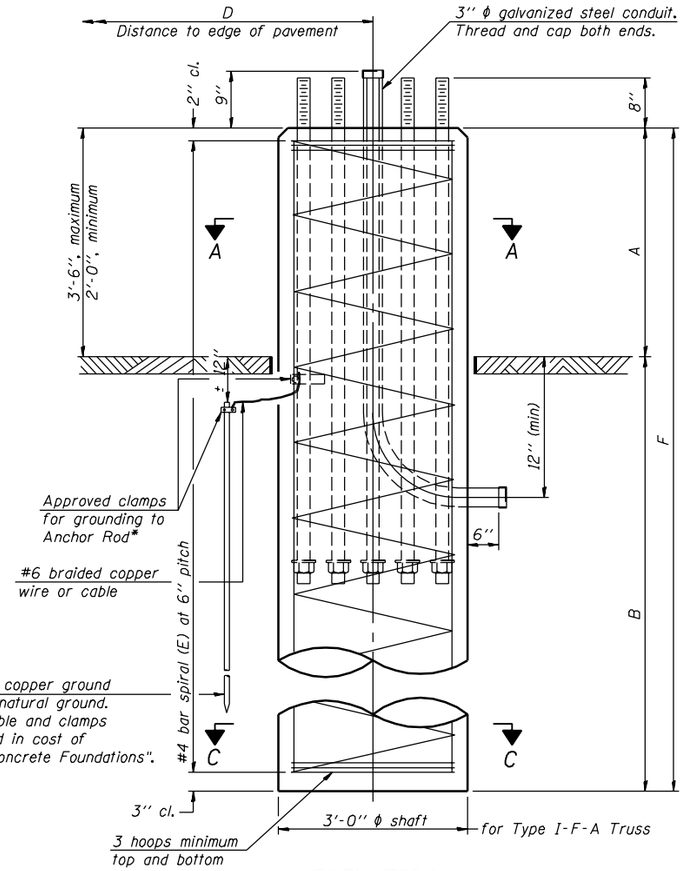
ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

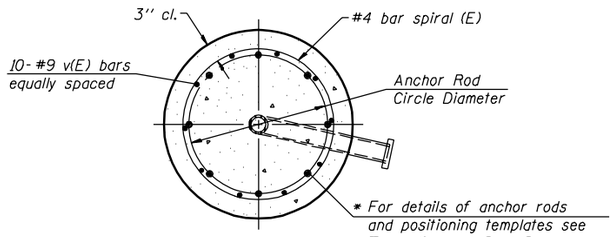
OSF-A-4-VMS 7/01/2006

BUTTERFLY SIGN STRUCTURES
TYPE I-F-A SUPPORT POST FOR FRONT ACCESS VMS - ALUMINUM TRUSS & STEEL POST

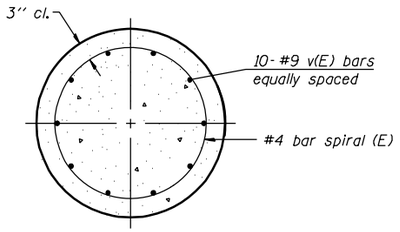
* Grind anchor rod to bright finish at ground clamp location before installing clamp.



ELEVATION



SECTION A-A
3'-0'' ϕ shaft



SECTION C-C
3'-0'' ϕ shaft

NOTES:

The foundation dimensions shown in the Foundation Design Table are based on the presence of mostly cohesive soils with an average Unconfined Compressive Strength (Qu) of at least 1.25 tsf. which must be determined by previous soil investigations at the jobsite. When other conditions are indicated, the boring data will be included in the plans and the foundation dimensions shown in the Foundation Data Table will be the result of site specific designs.

If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. If dimensions "B" or "F" are revised by more than 12" by the Contractor, "as-built" plans shall be prepared and submitted to the District Bureau of Operations for future reference.

No sonotubes or decomposable forms shall be used below the lower conduit entrance. Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Bridge Seat Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

STATE OF ILLINOIS
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FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. -
- SHEETS

Contract #

FOUNDATION DATA TABLE

Structure Number	Station	Truss Type	Shaft Diameter	Elevation Top	Elevation Bottom	A	B	F	Class SI Concrete Cubic Yards

NUMBER	REVISION	DATE

FOUNDATION DESIGN TABLE

Truss Type	Post Base Sheet	Maximum CantileverLength (ft)	Maximum Total Sign Area (sq ft)	Shaft Diameter (in)	"B" Depth (ft)	Anchor Rods		Anchor Rod Circle Diameter (in)
						No.	Diameter (in)	
I-F-A	OSF-A-4	10	200	3.0	17'-6''	8	2	22

BUTTERFLY SIGN STRUCTURES
DRILLED SHAFT FOR FRONT ACCESS VMS
ALUMINUM TRUSS & STEEL POST

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

- 200

EXAMINED

ENGINEER OF BRIDGE DESIGN

PASSED

ENGINEER OF BRIDGES AND STRUCTURES

OSF-A-9-VMS 7/01/2006